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(54) Title: ASSAY FOR DETECTING AND IDENTIFYING MICRO-ORGANISMS

(57) Abstract: The present invention also relates to an assay for detecting and identifying micro-organisms, and in particular bacteria. The present invention also relates to an assay for detecting micro-organisms, and in particular bacteria, in a sample, and for the discrimination thereof. More in particular the present invention relates to an assay for the molecular identification of bacteria according to Gram-, genus- species- and strain-specificity based on multigenotypic testing of bacterial DNA from human, animal or environmental samples.



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## Assay for detecting and identifying micro-organisms

### Field of the invention

The present invention relates to an assay and a method for diagnosing and identifying  
5 micro-organisms, and in particular bacteria. The present invention also relates to an assay  
and a method for detecting micro-organisms, and in particular bacteria, in a sample, and for  
the discrimination thereof.

More in particular the present invention relates to an assay and a method for the  
molecular identification of bacteria according to Gram-, genus- species- and strain-specificity  
10 based on multigenotypic testing of bacterial DNA from human, animal or environmental  
samples.

### Background

In the medical and veterinary clinical setting, detection and species identification of  
15 harmful bacteria infecting biological fluids or tissues is a pre-requisite for appropriate and  
timely relevant antibiotherapy. Such identification is classically performed by conventional  
microbiological methods (culture on solid medium or in liquid phase). These conventional  
methods have however their own limitations.

Culture is always followed by phenotypic identification, which is based on the  
20 biochemical features of the bacteria. Usually, the whole process requires 48 to 72 hours to  
be completed. This period is unfortunately too long, considering the speed of bacterial growth  
in infected tissues and, for some bacteria, the pathological effects related the toxins that they  
produce. This time is also too long when bacteria are spread in the environment (aerosol,  
food or water contamination), where germs are able to infect humans or animals and spread  
25 rapidly on a epidemic way from an infected to a healthy body on a very short time. There is  
therefore a need for the rapid detection and identification of pathogenic bacterial agent(s)  
involved in human or animal infections or present in the environment.

A stream of studies carried out recently has confirmed that molecular identification is  
more efficient than phenotypic identification (Bosshard *et al*, 2003; Bosshard *et al*, 2004;  
30 Lecouvet *et al*, 2004) and genotypic definition of bacteria species has now become the gold  
standard (Clarridge, 2004). There is therefore an increasing need for identifying bacterial  
species with more reliable methods. While obvious in the hospital setting, it is also of interest  
of the post September 2001 era, where accuracy and speed in identification of deadly  
bacteria are priorities.

Aside of the time required for routine microbiologic detection, another limiting factor is sometimes the lack of bacterial growth, generating a false-negative microbiologic result. False-negative bacterial cultures are not unusual in the clinical practice, even when clinical and biological signs clearly suggest a florid and active infection (Lecouvet *et al*, 2004). This false-negativity may be due to a low organism burden, non-culturable or slowly growing micro-organisms or, most often, to prior antibiotic therapy (Trampuz *et al*, 2003; Tzanakaki *et al*, 2003). In this case, a false-negative result hampers correct etiological diagnosis regarding the bacterial origin of the infectious disease, and precludes the use of early targeted antibiotherapy. As delayed antibiotherapy may increase the risk of worse clinical outcome (Gutierrez *et al*, 1998; Yu *et al*, 2003, Lecouvet *et al*, 2004), this situation often prompts the use of empiric, broad spectrum and sometimes long-term therapy, and certainly when there is no microbiologic result.

The higher sensitivity, speed and accuracy of DNA amplification by PCR for identification of bacteria is expected to reduce the time to diagnosis, to improve the diagnostic rate, and to allow an early choice of specific antibiotic treatment. Over the last decade, this expectation has fuelled the development of numerous promising DNA assays for detecting and identifying bacteria at the species- or genera-level in human and environmental samples (Jonas *et al*, 2003 ; Palomares *et al*, 2003 ; Poyart *et al*, 2001 ; Xu *et al*, 2002).

These assays remain however restricted to single species and/or genera (Brakstad *et al*, 1992 ; Poyart *et al*, 2001 ; Vannuffel *et al*, 1998). Such restriction has various disadvantages. For instance, in the absence of any indication on the presence of bacterial agents in an environmental sample or in a biological tissue/fluid sample from human or animal origin suspected to be infected but showing no bacterial background due to the presence of a normal bacterial flora, molecular screening methods have to be applied which target the greatest as possible number of potentially pathogenic bacteria including the most feared bacteria (*Staphylococci*, *Streptococci*, *Bacillus anthracis*, *Enterobacteriaceae*, *Neisseria*, etc...) that could be used by bioterrorists. In this case, the use of specific markers or well-defined genera requires multiple and/or repeated testing to confirm or exclude a bacterial diagnosis. Considering the cost of this strategy as well as the limited amount DNA usually available for one sample, this is practically impossible to be performed.

In another example, in samples from tissues showing a bacterial background due the presence of a normal flora, the identification of a well defined panel of pathogenic bacteria recognized as "prior key targets" in the clinical setting considered (e.g. community-acquired pneumonia) remains very difficult.

In view of the above, there is therefore a need for the rapid detection and identification of pathogenic bacterial agent(s) involved in human or animal infections or present in the environment.

There is also a need for identification and diagnostic tools, which allow screening for the presence of pathogenic bacterial agent(s), and to detect and identify these pathogenic bacteria within a bacterial background.

In particular, it is clear that there is a great need in the art for molecular screening/detection and identification assays and methods having a range of specificity that is as wide as possible in order to quickly detect the presence of bacteria (bacterial detection step), while allowing in parallel or subsequently, to identify the present bacterial species, genera and, optionally the strain (bacterial identification step).

In a first aspect, the present invention therefore aims to provide an improved assay for detecting micro-organisms, and in particular bacteria. It is further an aim of the invention to provide an improved assay for diagnosing bacterial infection of a sample and/or tissue.

In another aspect, the present invention also aims to provide an improved assay and method for the identification of micro-organisms. More in particular, the invention aims to identify and provide a series of specific, molecular markers for the detection and/or identification of micro-organisms, and preferably bacteria, in a Gram-, genus- species- and/or strain-specific way.

## Summary

The present invention relates to an assay for detecting and identifying one or more micro-organisms in a sample, characterized in that said assay comprises the use of at least two conserved molecular markers. Preferably said micro-organisms are bacteria. In a preferred embodiment, the assay of the present invention is characterized in that it comprises the use of at least one molecular marker that is conserved in Gram-positive bacteria and at least one molecular marker that is conserved in Gram-negative bacteria.

In the prior art, in order to detect the presence of bacteria in samples or tissues, extremely conserved molecular markers are generally used. The most commonly used sequences for detecting bacteria are the sequence of the gene coding for ribosomal DNA (16S rDNA gene) (Klaschik *et al*, 2002) and the 16S-23S intergenic region (Gurtler & Stanisich, 1996). However, ribosomal gene 16S rDNA does not always allow the distinction between species, as illustrated for the *Bacillus* species (La Scola *et al*, 2003). This is a major drawback in the 16S rDNA gene sequence identification method, because in some species, a sequence can be ambiguous since it does not distinguish between two closely related



clinical species but disclosing however a distinct virulence phenotype (for instances, *Escherichia coli* K12 versus *Escherichia coli* O157:H7). This remark applies to the intergenic spacer 16S-23S rDNA as well (Gianinno *et al*, 2003). There is therefore a need to develop a molecular identification system which better discriminate bacteria than the 16S rDNA and the intergenic spacer 16S-23S rDNA.

In accordance with the present invention two series of conserved molecular markers were identified and characterized which are extremely suitable for permitting the detection and genotyping of micro-organisms, and in particular of bacteria, in a Gram-specific way. More in particular these molecular markers comprise on one hand markers preferentially conserved in Gram-positive bacteria and the other hand markers that are preferentially conserved in Gram-negative bacteria. The present invention now allows, by a combined use of these two types of conserved molecular marker sequences, to detect bacteria in a sample and to genotype these bacteria in a gram-specific way as well as in a genera-, species-, and even sometimes, strain-specific manner.

So far, in conventional microbiology, one distinguishes the bacteria according to the structure of their wall (the wall is present in all bacteria except mycoplasmas). This structure conditions the color of bacteria after Gram staining (Gram is made of several successive steps including treatment with purple gentian, Lugol's solution, alcohol and fuchsin). The bacteria whose wall is permeable to alcohol lose their purple staining (violet gentian) and coloured in red (fuchsin), defining so what is considered as a Gram-negative bacteria. In Gram-positive bacteria, the wall is primarily made by peptidoglycane. In Gram-negative bacteria, the peptidoglycane layer is thin and the wall has a more complex structure. In the clinical practice, the choice of antibiotherapy relies primarily on Gram stain. Indeed, antibiotics targeting the bacterial wall are much more on Gram-positive bacteria. As already stated above, several clinical studies show that any delay with the initiation of antibiotherapy results in increased mortality and hospital morbidity. Practically, the microbiologic identification (culture) comes too late.

Such approach provides many advantageous compared to conventionally applied detection strategies, wherein no such gram-specificity is involved. The present invention now permits by the use two series of conserved molecular markers to rapidly determine the gram-phenotype of bacteria in a sample and as a consequence to rapidly determine the most suitable antibiotherapy to be applied. This can be substituted to the conventional Gram staining procedure which is far less sensitive.

In a preferred embodiment, the assay of the present invention is further characterized in that the molecular marker that is conserved in Gram-positive bacteria comprises PurA or

PstI. In a more preferred embodiment the molecular marker that is conserved in Gram-positive bacteria is selected from the group comprising the Spy0160 (marker I), Spy1372 (marker II), SpyM3\_0902 & SpyM3\_0903 (marker III) and Spy1527 (marker IV) marker sequences. In yet another more preferred embodiment, the molecular marker that is conserved in Gram-positive bacteria is selected from the group comprising the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.

Another preferred embodiment of the invention relates to an assay that is characterized in that the molecular marker that is conserved in Gram-negative bacteria is selected from the group comprising the Ecs0036 (marker V), HI1576 (marker VI), EG10839 and EG11396 (marker VII), and HI0019 (marker VIII) sequences.

In yet another preferred embodiment the molecular marker that is conserved in Gram-negative bacteria is selected from the group comprising the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

Table 1 summarizes sequences used in accordance with the present invention for the detection and identification of Gram-positive and Gram-negative bacteria.

Table 1

Gram-positive bacteria					
Sequence	Gene	Marker	Sequences found in Gram-positive bacteria (SEQ ID NOs: )	Overlapping sequences found in Gram-negative bacteria (SEQ ID NOs: )	Sequences found in other organisms (SEQ ID NO: )
Spy0160	PurA	I	1-62 ; 326-359	63	
Spy1372	PstI	II	64-107 ; 109-111 ; 117-129 ; 137 ; 145-148 ; 360-395 ; 397-399	108 ; 112-116 ; 130-136 ; 138-144 ; 396 ; 400-403	149 ( <i>Cryptococcus neoformans</i> )
SpyM3_0902 & SpyM3_0903	Hypothetical protein	III	150-180; 404-412		
Spy1527	Hypothetical protein	IV	181-193; 413-425		

Gram-negative bacteria					
Sequence	Gene	Marker	Sequences found in Gram-negative bacteria	Overlapping sequences found in Gram-positive bacteria	Sequences found in other organisms

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Ecs0036	carB	V	194-232 ; 238-239 ; 242-254 ; 431-442	233-237 ; 240-241 ; 255	
HI1576	pgi	VI	256-277; 426-430		
EG10839 & EG11396	sfrB & yigC	VII	278-303; 443-451		
HI0019	yleA	VIII	304-325; 452-461		

The present invention also relates to the use of an assay as defined herein for diagnosing bacterial infection of a sample.

The foregoing and other objects, features and advantages of the invention will become more readily apparent from the following detailed description of preferred embodiments.

### Description of the figures

**Figure 1** represents the amplification of a molecular marker I (Spy0160 or *pur A*) in Gram-positive bacteria.

**Figure 2** represents the amplification of a molecular marker II (Spy1372 or *ptsI*) in Gram-positive bacteria.

**Figure 3** represents the amplification of a molecular marker III (SpyM3\_0902 & SpyM3\_0903) in Gram-positive bacteria.

**Figure 4** represents marker I (*purA*) sequences amplified from different Gram-positive bacteria (SEQ ID NOs 1-62), and from a Gram-negative bacterium (SEQ ID NO: 63)

**Figure 5** represents marker II (*ptsI*) sequences amplified from Gram-positive bacteria (SEQ ID NOs: 64-107; SEQ ID NOs: 109-111, SEQ ID NOs: 117-129, SEQ ID NO: 137, SEQ ID NOs 145-148), from some Gram-negative bacteria (SEQ ID NOs 108, 112-116, 130-136, 138-144) and from the fungi *Cryptococcus neoformans* (SEQ ID NO: 149).

**Figure 6** represents marker III (SpyM\_0902 & SpyM\_0903) sequences amplified from Gram-positive bacteria (SEQ ID NOs 150-180).

**Figure 7** represents marker IV (putative GTP-binding factor plus 160 nt downstream this ORF) sequences amplified from Gram-positive bacteria (SEQ ID NOs 181-193)

**Figure 8** represents the amplification of a molecular marker V (Ecs0036 or *carB*) in Gram-negative bacteria.

**Figure 9** represents sequences amplified with molecular marker V (*carB*) from various Gram-negative bacteria (SEQ ID NOs 194-232, 238-239, 242-254) and from various Gram-positive bacteria (SEQ ID NOs 233-237, 240-241, 255)

**Figure 10** represents the amplification of a molecular marker VI (HI1576 or *pgi*) in Gram-negative bacteria.

**Figure 11** represents sequences amplified with molecular marker VI (HI1576 or *pgi*) from various Gram-negative bacteria (SEQ ID NOs 256-277).

5 **Figure 12** represents sequences amplified with molecular marker VII (EG10839 & EG11396 or *sfrB* & *yigC*) in Gram-negative (SEQ ID NOs 278-303).

**Figure 13** represents sequences amplified with molecular marker VIII (HI0019 or hypothetical *yleA* protein) in Gram-negative bacteria (SEQ ID NOs 304-325).

10 **Figure 14** represents marker I (Spy0160 or *purA*) sequences amplified from different Gram-positive bacteria (SEQ ID NOs 326-359).

**Figure 15** represents marker II (Spy1372 or *pstI*) sequences amplified from Gram-positive bacteria (SEQ ID NOs: 360-395; SEQ ID NOs: 397-399), and some Gram-negative bacteria (SEQ ID NOs 396, 400-403).

15 **Figure 16** represents marker III (SpyM\_0902 & SpyM\_0903) sequences amplified from Gram-positive bacteria (SEQ ID NOs 404-412).

**Figure 17** represents marker IV (Spy1527, a putative GTP-binding factor plus 160 nt downstream) sequences amplified from Gram-positive bacteria (SEQ ID NOs 413-425).

**Figure 18** represents sequences amplified with molecular marker VI (HI1576 or *pgi*) from various Gram-negative bacteria (SEQ ID NOs 426-430).

20 **Figure 19** represents sequences amplified with molecular marker V (Ecs0036 or *carB*) from various Gram-negative bacteria (SEQ ID NOs 431-442).

**Figure 20** represents sequences amplified with molecular marker VII (EG10839 & EG11396 or *sfrB* & *yigC*) in Gram-negative (SEQ ID NOs 443-451).

25 **Figure 21** represents sequences amplified with molecular marker VIII (HI0019, hypothetical *yleA* protein) in Gram-negative bacteria (SEQ ID NOs 452-461).

### Detailed description of the invention

The following definitions serve to illustrate the terms and expressions used in the different embodiments of the present invention as set out below.

30 An "isolated" nucleic acid molecule is one which is separated from other nucleic acid molecules which are present in the natural source of the nucleic acid. For example, with regards to genomic DNA, the term "isolated" includes nucleic acid molecules which are separated from the chromosome with which the genomic DNA is naturally associated.

The term "probe" or "nucleic acid probe" refers to single stranded sequence-specific oligonucleotides which have a base sequence which is sufficiently complementary to hybridize to the target base sequence to be detected.

5 The term "primer" refers to a single stranded DNA oligonucleotide sequence capable of acting as a point of initiation for synthesis of a primer, extension product which is complementary to the nucleic acid strand to be copied. The length and the sequence of the primer must be such that they allow to prime the synthesis of the extension products. Preferably the primer is about 5-50 nucleotides long. Specific length and sequence will depend on the complexity of the required DNA or RNA targets, as well as on the conditions  
10 of primer use such as temperature and ionic strength.

The term "target" refers to nucleic acid molecules originating from a biological sample which have a base sequence complementary to the nucleic acid probe of the invention. The target nucleic acid can be single-or double-stranded DNA (if appropriate, obtained following amplification) and contains a sequence which has at least partial complementarity with at  
15 least one probe oligonucleotide.

The phrase "a (biological) sample" refers to a specimen such as a clinical sample (pus, sputum, blood, urine, etc. ) of human or animal, an environmental sample, bacterial colonies, contaminated or pure cultures, purified nucleic acid, etc. in which the target sequence of interest is sought.

20 The term "polynucleic acid" corresponds to either double- stranded or single-stranded cDNA or genomic DNA, containing at least 10, 20, 30, 40 or 50 contiguous nucleotides.

A polynucleic acid which is smaller than 100 nucleotides in length is often also referred to as an oligonucleotide. Single stranded polynucleic acid sequences are always represented in the present invention from the 5' end to the 3' end. By "oligonucleotide" is  
25 meant a nucleotide polymer generally about 10 to about 100 nucleotides in length, but which may be greater than 100 or shorter than 10 nucleotides in length.

The term "homologous" is synonymous for identical and means that polynucleic acids which are said to be e. g. 90% homologous show 90% identical base pairs in the same position upon alignment of the sequences.

30 "Hybridization" involves the annealing of a complementary sequence to the target nucleic acid (the sequence to be detected). The ability of two polymers of nucleic acid containing complementary sequences to find each other and anneal through base pairing interaction is a well-recognized phenomenon.

The term "stringency" indicates one used to describe the temperature and solvent  
35 composition existing during hybridization and the subsequent processing steps. Under high

stringency conditions only highly complementary nucleic acid hybrids will form; hybrids without a sufficient degree of complementarity will not form. Accordingly, the stringency of the assay conditions determines the amount of complementarity needed between two nucleic acid strands forming a hybrid. Stringency is chosen to maximize the difference in stability between the hybrid formed with the target and the non-target nucleic acid.

By "complementary" is meant a property conferred by the base sequence of a single strand of DNA which may form a hybrid or double stranded DNA: DNA, through hydrogen bonding between Watson-Crick base pairs on the respective strands. Adenine (A) usually complements thymine (T), while guanine (G) usually complements cytosine (C).

By "hybrid" is meant the complex formed between two single stranded nucleic acid sequences by Watson-Crick base pairings or non-canonical base pairings between the complementary bases.

#### Molecular Marker sequences

In a first aspect, the present invention provides conserved molecular markers for the detection and/or identification of one or more micro-organisms, and preferably bacteria. More in particular, the present invention provides two series of conserved molecular markers which are extremely suitable for permitting the detection and genotyping of micro-organisms, and in particular of bacteria, in a Gram-specific way.

The term "*molecular marker*" and "*molecular marker sequence*" are used herein as synonyms. These terms refer to isolated and purified nucleic acid (DNA) molecules. The term "*conserved molecular marker*" as used herein refers to a coding or non coding DNA sequence, which can be found in the genome of various bacterial species, showing a sequence identity with an original sequence which is superior to or equal to 50%, and preferably superior to or equal to 65%, and more preferably superior to or equal to 80%.

According to the present invention, two series of conserved genetic markers were characterized: one preferentially conserved in Gram-positive bacteria and the other preferentially conserved in Gram-negative bacteria.

In a preferred embodiment, the molecular markers that are conserved in Gram-positive bacteria comprise Spy0160 (PurA) or Spy1372 (PstI). More preferably the markers that are conserved in Gram-positive bacteria are selected from the group comprising Spy0160 Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527 marker sequences

In another preferred embodiment, the molecular markers that are conserved in Gram-positive bacteria are any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.

In yet another preferred embodiment, the molecular markers that are conserved in Gram-negative bacteria are selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396, and HI0019.

In another preferred embodiment, the molecular markers that are conserved in Gram-negative bacteria are any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461. However, it should be clear from the present invention that the present invention is not limited to the molecular marker sequences conserved in Gram-positive and in Gram-positive bacteria as described herein. Other conserved molecular marker sequences that can be characterized and identified for various other Gram-positive bacteria and other Gram-negative bacteria including according to the invention are considered to be included in the present application as well.

In another embodiment, the invention relates to the use of at least two conserved molecular markers for detecting bacteria in a sample.

In a preferred embodiment, the invention relates to the use of at least two conserved molecular markers for detecting and genotyping a bacterium on the basis of the Gram phenotype in a sample. Preferably, the invention relates to the use of at least one molecular marker that is conserved in Gram-positive bacteria and at least one molecular marker that is conserved in Gram-negative bacteria for detecting and genotyping a bacterium. In particularly preferred embodiment, the invention relates to the use of at least one molecular marker that is conserved in Gram-positive bacteria selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, and at least one molecular marker that is conserved in Gram-negative bacteria and that is selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396, HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

The present invention thus provides for highly conserved molecular markers that can be used for detecting the molecular presence of micro-organisms, and in particular of bacteria, in samples and/or tissues, including in cultured samples which give a false-negative result using conventional detection techniques. The present conserved markers can also advantageously be used for detecting the molecular presence of micro-organisms, and in particular of bacteria, in samples from tissues showing bacterial background. In the latter case, the conserved molecular markers are preferably used in combination with specific

primers or probes that directly target a pre-defined panel of bacteria of interest and that exclude the "background flora". A suitable pre-defined panel of bacteria of interest may, for instance, include bacteria involved in community-acquired pneumonia, such as but is not limited to *Haemophilus influenzae*, *Legionella species*, *Staphylococcus aureus*, *Moraxella catarrhalis*, *Gram-negative enteric bacteria*.

It is further noted that the molecular identification of Gram phenotype is based on partially overlapping Gram-positive and Gram-negative markers. It must be born in mind that, unlike in the present invention, another conserved marker (16S) shows an extensive overlap between Gram-positive and Gram-negative bacteria. In the present case, using concomitantly both series of partially overlapping markers in a combined way makes it possible to cover a much broader spectrum of bacterial pathogens while defining also precisely the Gram phenotype of those pathogens. The strategy relies upon the molecular detection of gene preferentially present in Gram-positive or Gram-negative bacterial. Each series of markers allows therefore improving overall detection in their respective group (either Gram-positive bacteria for preferentially Gram-positive markers, or Gram-negative bacteria for preferentially Gram-negative markers). Considering the somehow overlapping specificity for both groups, (overlap within the Gram-positive specificity for Gram-negative markers and overlap within the Gram-negative specificity for Gram-positive markers), the power of the molecular discrimination is even increased for some bacteria targeted by both groups of markers. This combined strategy overcomes the potential lack of specificity obtained when using one single marker towards some species, as is for instance the case when using a 16S marker.

In addition, the use of different markers which are mapped on different loci in the bacteria also improves the quality of the diagnosis in that it can more easily circumvent false positive reactions due to accidental PCR contamination hampering the use of one particular marker.

#### Primers and probes derived from conserved molecular markers

In another embodiment, the invention relates to a primer pair (forward and reverse primers) suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria. More preferably, the invention relates to a primer pair suitable for amplifying any of the conserved molecular marker sequences that are conserved in Gram-positive bacteria as defined herein, and that are preferably selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID



NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.

In another embodiment, the invention relates to a primer pair (forward and reverse primers) suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria. More preferably, the invention relates to a primer pair suitable for amplifying any of the conserved molecular marker sequences that are conserved in Gram-negative bacteria as defined herein, and that are preferably selected from the group comprising Ecs0036, HI1576,, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

The primers of the present invention include at least 15-mer oligonucleotide and are preferably 70%, 80%, 90% or more than 95% homologous to the exact complement of the target sequence to be amplified. Those primers are about 15 to 50 nucleotides long, and preferably about 15 to 35 nucleotides long. Of course, primers consisting of more than 50 nucleotides can be used.

The present invention also relates to a nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria. More preferably, the invention relates to a nucleic acid probe capable of hybridizing any of the molecular marker sequences that are conserved in Gram-positive bacteria as defined herein, and that are preferably selected from the group comprising Spy0160 (PurA), Spy1372 (PstI), SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.

In another embodiment, the present invention also relates to a nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria. More preferably, the invention relates to a nucleic acid probe capable of hybridizing any of the molecular marker sequences that are conserved in Gram-negative bacteria as defined herein, and that are preferably selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

The probe of the present invention preferably includes at least 15-mer oligonucleotide and are preferably 70%, 80%, 90% or more than 95% homologous to the exact complement of the target sequence to be detected. Those probes are preferably about 15 to 50 nucleotides long. The primers and probes of the invention can be used, for diagnostic purposes, in investigating the presence or the absence of a target nucleic acid in a biological

sample, according to all the known hybridization techniques such as for instance dot blot, slot blot, hybridization on arrays including nanotools, real-time PCR, etc...

The probes of the invention will preferably hybridize specifically to one or more of the above-mentioned molecular marker sequences.

5       The primers of the invention may amplify specifically one or more of the above-mentioned marker sequences. The design of specifically hybridising probes is within the skilled person's knowledge. Also the design of primers which can specifically amplify certain sequences or molecular markers is within the skilled person's knowledge.

10       The nucleic acid probes of this invention can be included in a composition or kit which can be used to rapidly determine the presence or absence of pathogenic species of interest (see below).

### Compositions

15       In another embodiment, the invention relates to a composition. In a preferred embodiment, the invention relates to a composition comprising at least one primer pair (forward and reverse primers) suitable for amplifying a conserved molecular marker that is conserved in Gram-positive bacteria and at least one primer pair (forward and reverse primers) suitable for amplifying a conserved molecular marker that is conserved in Gram-negative bacteria.

20       Preferably, the composition comprises at least one primer pair suitable for amplifying any of the molecular marker sequences that are conserved in Gram-positive bacteria and that are selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, 25       and at least one primer pair suitable for amplifying any of the molecular marker sequences that are conserved in Gram-negative bacteria and that are selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

30       In yet another embodiment, the invention relates to a composition comprising at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria. Preferably, the composition comprises at least one nucleic acid probe capable of hybridizing to a molecular marker that is 35       conserved in Gram-positive bacteria selected from the group comprising Spy0160, Spy1372,

SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, and at least one at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

By "composition", it is meant that primers or probes complementary to bacterial DNA may be in a pure state or in combination with other primers or probes. In addition, the primers or probes may be in combination with salts or buffers, and may be in a dried state, in an alcohol solution as a precipitate, or in an aqueous solution.

#### Kits

In yet another embodiment, the invention relates to a kit for detecting and identifying one or more micro-organisms, preferably bacteria, in a sample, which comprises:

a) a composition comprising at least one primer pair (forward and reverse primers) suitable for amplifying a conserved molecular marker that is conserved in Gram-positive bacteria and at least one primer pair (forward and reverse primers) suitable for amplifying a conserved molecular marker that is conserved in Gram-negative bacteria; for amplifying polynucleic acids in said sample,

b) a composition comprising at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria,

c) a buffer enabling hybridization reaction between the probes contained in said composition and the polynucleic acids present in said sample or amplified products therefrom or components necessary for producing the buffer,

d) a solution for washing hybrids formed under the appropriate wash conditions or components necessary for producing the solution, and

e) optionally a means for detection of said hybrids.

A kit according to the invention preferably includes all components necessary to assay for the presence of bacteria. In the universal concept, the kit includes a stable preparation of labeled probes, hybridization solution in either dry or liquid form for the hybridization of target and probe polynucleotides, as well as a solution for washing and

removing undesirable and nonduplexed polynucleotides, a substrate for detecting the labeled duplex, and optionally an instrument for the detection of the label.

In a preferred embodiment, the present kit comprises a composition which comprises at least one primer pair suitable for amplifying any of the molecular marker sequences that are conserved in Gram-positive bacteria selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, and at least one primer pair suitable for amplifying any of the molecular marker sequences that are conserved in Gram-negative bacteria selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

In yet another preferred embodiment, the present kit comprises a composition which comprises at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, and at least one at least one nucleic acid probe capable of hybridising to a molecular marker that is conserved in Gram-negative bacteria selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

In yet another preferred embodiment, the kit according to the present invention further comprises one or more genus-, species and/or strain-specific nucleic acid probes capable of hybridizing to a genus-, species and/or strain-specific bacterial polynucleotide sequence.

#### DNA chip

In another preferred embodiment, the present invention provides a DNA chip in which nucleic acid probes are immobilized on a solid support. The invention relates to the manufacturing of a solid support (array –DNA chip) on which several sets of nucleic acid probes are covalently bound or directly synthesized.

In a preferred embodiment, the invention relates to a DNA chip in which at least one of nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria, is immobilized on a solid support.

Preferably, the DNA chip comprises at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, and Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461 immobilized on a solid support.

In yet another preferred embodiment, the DNA chip according to the present invention further comprises one or more genus-, species and/or strain-specific nucleic acid probes capable of hybridizing to a genus-, species and/or strain-specific bacterial polynucleotide sequence.

The DNA chip which is formed by arranging DNA fragments of variety of base sequences on the surface of a narrow substrate in high density is used in finding out the information on DNA of an unknown sample by hybridization between an immobilized DNA and unknown DNA sample complementary thereto. Examples of the solid carrier on which the probe oligonucleotides are fixed include inorganic materials such as glass and silicon and polymeric materials such as acryl, polyethylene terephthalate (PET), polystyrene, polycarbonate and polypropylene. The surface of the solid substrate can be flat or have a multiple of hole. The probes are immobilized on the substrate by covalent bond of either 3'end or 5'end. The immobilization can be achieved by conventional techniques, for example, using electrostatic force, binding between aldehyde coated slide and amine group attached on synthetic oligomeric phase or spotting on amine coated slide, L- lysine coated slide or nitrocellulose coated slide. The immobilization and the arrangement of various probes onto the solid substrate are carried out by pin microarray, inkjet, photolithography, electric array, etc.

The term "DNA chip" as used herein, is to be understood in its broadest sense, i.e. including nanochips or nanotools that are designed to recognize a specific pattern of nucleic acids through hybridization.

### Assay

In another embodiment, the invention relates to an assay for detecting and identifying one or more micro-organisms, preferably bacteria, in a sample, characterized in that said assay comprises the use of at least two conserved molecular markers, and preferably

comprises the use of at least one molecular marker that is conserved in Gram-positive bacteria and at least one molecular marker that is conserved in Gram-negative bacteria.

In the prior art, ultimate molecular species identification results classically from sequence analysis of an amplification product and the comparison of this sequence with those which are available in public DNA database (for instance, GeneBank...). The sequence analysis requires nearly 24 hours to complete the various analytical steps: amplicon purification, cycle sequencing, reading and interpretation of the results.

The present invention provides a strategy which permits to significantly reduce the time requested for genera, species, and optionally strain, identification of bacteria in a sample compared to classical identification strategies as described above. More in particular, the present strategy preferably consists in amplifying a set of conserved genetic markers and either to hybridize produced amplicons on specific capture probes covalently bound on an array or, alternatively, to hybridize a specific probe during the amplification step (e.g. real-time PCR with Taqman or molecular Beacon probes). The result of the identification will include information regarding the Gram phenotype of bacteria present in the sample of interest (or a combination of both Gram phenotype in case of mixed infections with Gram-positive and Gram-negative), as well as information on genera and species to which they belong. The final results will integrate all the hybridization signals generated by the selected markers.

In a preferred embodiment, the method for detecting and identifying one or more micro-organisms, preferably bacteria, in a sample may comprise the following steps:

- a) If appropriate isolating and/or concentrating the DNA present in said sample;
- b) amplifying said DNA with
  - o at least one pair of (forward and reverse) primers suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria, and
  - o at least one pair of (forward and reverse) primers suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria,
- c) hybridizing the amplified DNA fragments obtained in step b) with genus-, and/or species-, and/or strain-specific primers or nucleic acid probes
- d) detecting the hybrids formed in step c) and
- e) identifying micro-organisms in said sample from the differential hybridization signals obtained in step d)

The present invention allows to detect the presence of bacteria in human, animal and/or environmental samples, and, at the same time, to identify those bacteria, including, highly pathogenic ones. Such detection and identification system is based on the pattern of

hybridization of several combined DNA fragments. Identification relies upon concomitant signals generated by a panel of unrelated markers. The system provides discrimination based on the Gram-phenotype as well as genus- and species-specificity.

To provide nucleic acid substrates for use in the detection and identification of micro-organisms in clinical samples using the present assay, nucleic acid, preferably DNA, is extracted from the sample. The nucleic acid may be extracted from a variety of clinical samples, or environmental samples, using a variety of standard techniques or commercially available kits.

A second step is an amplification of the desired DNA region of the target DNA by PCR. Examples of the PCR include most typical PCR using the same amounts of forward and reverse primers, multiplex PCR in which a multiple of target DNAs can be amplified at once by adding various primers simultaneously, ligase chain reaction (LCR) in which target DNA is amplified using specific 4 primers and ligase and the amount of fluorescence is measured by ELISA (Enzyme Linked Immunosorbent Assay), and the other PCR such as Hot Start PCR, Nest-PCR, DOP-PCR (degenerate oligonucleotide primer PCR), RT-PCR (reverse transcription PCR), Semi-quantitative RT-PCR, Real time PCR, RACE (rapid amplification of cDNA ends), Competitive PCR, STR (short tandem repeats), SSCP (single strand conformation polymorphism), DDRT-PCR (differential display reverse transcriptase), etc.

A further step comprises the hybridization of the amplified DNA fragments obtained in step b) with specific primers or nucleic acid probes. The choice of the applied hybridization technique should not be considered as limitative for the present invention. Nanotools can also be designed to recognize a specific nucleic acid pattern with or without PCR amplification.

In one embodiment, step c) may include an identification by contacting the amplified DNA fragments obtained in step b) with a composition comprising at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria. In such case, steps b) and c) of the above described method are performed subsequently. For instance, identification may be performed using a reverse hybridization procedure (dot blot, slot blot, hybridization on micro-, macro- or nano-arrays, etc....) In such case, hybridization of marked amplicons is performed on Gram-, genera- and species-specific nucleic acid probes bound covalently on the array (e.g. micro- or macro-arrays). While the result is visual, the reading can also be automated, facilitating therefore the use in the clinical practice.

In another embodiment, step c) may include the use of real-time PCR with specific probes (multiplex approach) which allows to have a specific result in a couple of hours. Simplex or multiplex PCR techniques in real-time include the use of specific acid probes on a DNA target during the PCR step (e.g. Taqman probes, molecular beacons or MGB (Minor Groove Binding) probes, etc...). In such case, steps b) and c) of the above described method are performed simultaneously. A significant advantage of using a real-time PCR technique is the increased speed, e.g. only a couple of hours are required for obtained final results. This is mainly due to the reduced cycle times, removal of separate post-PCR detection procedures, and the use of sensitive fluorescence detection equipment, allowing earlier amplicon detection. Another advantage of a real-time PCR technique is that it is a single tube procedure with the reading during the PCR and no manipulation required at the end of the procedure. This single tube procedure prevents therefore the risk of molecular contamination existing with other PCR procedures, including micro- and macro-array techniques. Preferably a nested real-time PCR strategy is used to increase the sensitivity of the method with a detection limit of one DNA copy in tissue samples.

The formed hybrids can be quantified by labeling the target with a fluorescence or radioactive isotope in accordance to conventional methods. The labeling may be carried out by the use of labeled primers or the use of labeled nucleotides incorporated during the polymerase step of the amplification.

According to a preferred embodiment of the present invention, the primers suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria used in step b) of the above mentioned method preferably comprise primers suitable for amplifying a molecular marker selected from the group comprising Spy0160, Spy1372, SpyM3\_0902 & SpyM3\_0903, Spy1527, or any of the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.

According to another preferred embodiment of the present invention, the primers suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria used in step b) of the above mentioned method preferably comprise primers suitable for amplifying a molecular marker selected from the group comprising Ecs0036, HI1576, EG10839 & EG11396 and HI0019, or any of the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.

The following examples are meant to illustrate the present invention. **Examples 1-3** present and describe molecular marker sequences that have been characterized on a wide panel of clinical and reference bacterial genera species and bacterial strains and that allow the discrimination between Gram-positive and Gram-negative bacteria as well as genera and



species identification. **Example 4** illustrates the use of molecular markers according to the present invention for the detection and identification of *Bacillus* bacteria and for the discrimination between various *Bacillus* strains of the same species. **Example 5** illustrates nucleic acid probes according to the present invention.

5

## Examples

### Example 1 Characterization of molecular markers of genes enabling the identification of Gram-positive bacteria

The present example aims to test the Gram-positive specificity of several markers. The list of Gram-positive bacteria used in the present example (study of markers specificity) is given in **table 2A**.

10

**Table 2A** Gram-positive bacteria

genus	species	strain reference
<i>Bacillus</i>	<i>anthracis</i>	1978
<i>Bacillus</i>	<i>anthracis</i>	STERNE
<i>Bacillus</i>	<i>anthracis</i>	BUTARE
<i>Bacillus</i>	<i>anthracis</i>	1655H85
<i>Bacillus</i>	<i>anthracis</i>	CODA - CERVA
<i>Bacillus</i>	<i>anthracis</i>	2054H82
<i>Bacillus</i>	<i>cereus</i>	ATCC10987
<i>Bacillus</i>	<i>cereus</i>	ATCC 14579
<i>Bacillus</i>	<i>pumilus</i>	Clinical
<i>Bacillus</i>	<i>species</i>	Clinical
<i>Bacillus</i>	<i>thuringiensis kurstaki</i>	T03A016 HD_1
<i>Bacillus</i>	<i>thuringiensis israelensis</i>	4Q2_72
<i>Bacillus</i>	<i>mycoides</i>	MYC003
<i>Bacillus</i>	<i>mycoides</i>	NRS306
<i>Bacillus</i>	<i>weihenstephanensis</i>	WSBC10204
<i>Bacillus</i>	<i>halodurans</i>	DSMZ 497
<i>Bacillus</i>	<i>firmus</i>	DSMZ 12643
<i>Bacillus</i>	<i>megatherium</i>	DSMZ 1324
<i>Bacillus</i>	<i>pseudomycoïdes</i>	DSMZ 12442
<i>Clostridium</i>	<i>difficile</i>	DSMZ 1296
<i>Clostridium</i>	<i>perfringens</i>	DSMZ 756
<i>Enterococcus</i>	<i>faecium</i>	DSMZ 6177
<i>Enterococcus</i>	<i>faecalis</i>	DSMZ 2570
<i>Enterococcus</i>	<i>flavescens</i>	DSMZ 7370
<i>Enterococcus</i>	<i>durans</i>	DSMZ 20633
<i>Enterococcus</i>	<i>casseliflavus</i>	DSMZ 20680
<i>Enterococcus</i>	<i>gallinarum</i>	DSMZ 20628
<i>Enterococcus</i>	<i>hirae</i>	DSMZ 20160
<i>Enterococcus</i>	<i>raffinosis</i>	DSMZ 75633

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<i>Enterococcus</i>	<i>avium</i>	DSMZ 20679
<i>Enterococcus</i>	<i>villorum</i>	CODA - CERVA
<i>Lactococcus</i>	<i>lactis</i>	DSMZ 20481
<i>Listeria</i>	<i>monocytogenes</i>	DSMZ 20600
<i>Listeria</i>	<i>innocua</i>	DSMZ 20649
<i>Staphylococcus</i>	<i>aureus</i>	ATCC 35884
<i>Staphylococcus</i>	<i>epidermidis</i>	ATCC 14990
<i>Staphylococcus</i>	<i>hominis</i>	ATCC 27844
<i>Staphylococcus</i>	<i>haemolyticus</i>	ATCC 29970
<i>Staphylococcus</i>	<i>saprophyticus</i>	ATCC 15305
<i>Staphylococcus</i>	<i>xylosus</i>	ATCC 35663
<i>Staphylococcus</i>	<i>simulans</i>	ATCC 27848
<i>Staphylococcus</i>	<i>cohnii cohnii</i>	ATCC 35662
<i>Staphylococcus</i>	<i>capitis capitis</i>	ATCC 27840
<i>Staphylococcus</i>	<i>sciuri</i>	ATCC 29062
<i>Staphylococcus</i>	<i>warneri</i>	ATCC 27836
<i>Staphylococcus</i>	<i>lugdunensis</i>	ATCC 43809
<i>Staphylococcus</i>	<i>gallinarum</i>	ATCC C3572
<i>Staphylococcus</i>	<i>schleiferi schleiferi</i>	ATCC 43808
<i>Staphylococcus</i>	<i>capitis ureolyticus</i>	ATCC 49326
<i>Staphylococcus</i>	<i>cohnii urealyticum</i>	ATCC 49330
<i>Staphylococcus</i>	<i>auricularis</i>	ATCC 33753
<i>Staphylococcus</i>	<i>caseolyticus</i>	ATCC 13548
<i>Staphylococcus</i>	<i>intermedius</i>	ATCC 29663
<i>Streptococcus</i>	<i>pyogenes</i>	DSMZ 20565
<i>Streptococcus</i>	<i>agalactiae</i>	DSMZ 2134
<i>Streptococcus</i>	<i>pneumoniae</i>	DSMZ 20566
<i>Streptococcus</i>	<i>oralis</i>	DSMZ 20627
<i>Streptococcus</i>	<i>sanguinis</i>	DSMZ 20567
<i>Streptococcus</i>	<i>mitis</i>	DSMZ 12643
<i>Streptococcus</i>	<i>gordonii</i>	DSMZ 6777
<i>Streptococcus</i>	<i>canis</i>	DSMZ 20386
<i>Streptococcus</i>	<i>mutans</i>	DSMZ 20523
<i>Streptococcus</i>	<i>subspecies</i>	Clinical
<i>Streptococcus</i>	<i>bovis</i>	DSMZ 20480
<i>Streptococcus</i>	<i>thermophilus</i>	DSMZ 20617
<i>Streptococcus</i>	<i>suis</i>	DSMZ 9682

The following sequences have been characterized and used for multigenotypic identification of Gram-positive bacteria.

5 The **Spy0160 sequence** (marker I) from *Streptococcus pyogenes* (accession number: AE006485.1; position 3201 to 4030) is part of an open reading frame homologous for the gene *purA*. The *purA* protein plays an important role in the *novo* bacterial synthesis of purines. It catalyses the synthesis of adenylosuccinate starting from inosine monophosphate (IMP) and of aspartate, and using energy provided by the GTP. The first nucleotides alignments performed suggested the existence of conserved sequences similar to the

Spy0160 sequence in a few Gram-positive bacteria. These findings have been extended to a wide panel of bacteria that were available in our DNA bank and confirmed that this marker was present in almost all Gram-positive bacteria and was very helpful in discrimination of closely related Gram-positive species and in many cases could allow discrimination between strains of the same species

A second marker is the **Spy1372 sequence** (Marker II) from *Streptococcus pyogenes* (accession n° AE004092, position 1139277 to 1141010). The corresponding gene probably encodes an enzyme involved in the transport of sugar in bacteria. Indeed, this gene is homologous to gene ptsI of *Staphylococcus aureus* coding for a phosphoenol pyruvate phosphatase (accession n° NC\_002758, from position 1137273 to 1138991). This gene is part of PTS operon (phosphotransferase system) including several genes coding for proteins involved in importation of sugar by bacteria (Plumbridge *et al*, 2002). The product of ptsI gene is a protein called Enzyme I, which may be phosphorylated by phosphoenol pyruvate. Phosphorylated Enzyme I can give its phosphate group to another protein of the PTS group through a cascade which leads to the entry of glucose in the bacterial periplasm (Stentz *et al*, 1997).

A third marker is the **SpyM3\_0902 - SpyM3\_0903 sequence** (Marker III) from *Streptococcus pyogenes* MGAS315 (accession n° AE014154, from position 40670 to 41160). This sequence is located downstream the gene encoding alpha-helicase and corresponds to the open reading frame of a hypothetical protein.

A fourth marker is the **Spy1527 sequence** (Marker IV) from *Streptococcus pyogenes* from position 1201 to 2464, including nucleotides 2465 to 2625 (accession n° AE006586). The Spy1527 sequence corresponds to the gene *typA*, coding for a putative GTP-binding protein (GTP-BP). The fragment from position 2465 to 2625 does not correspond to an open reading frame, but is a non-coding sequence.

A first analysis of some available complete bacterial genomes suggests that homologous sequences were present in most of those bacteria.

A further analysis has been performed on reference strains and on several hundreds clinical strains provided by Belgian hospitals. The conservation of targets of interest (*purA* and *ptsI* (i.e. Marker I and II) has been confirmed in the genome of all these reference and clinical strains. This analysis confirmed the very little genomic variability of these sequences within a species of interest. This feature is crucial to allow the use of these marker sequences in a strategy of multigenotypic identification of Gram-positive bacteria.

**Example 2** Characterization of molecular markers of genes enabling the identification of  
Gram-negative bacteria

The present example aims to test the Gram-negative specificity of several markers. The list of Gram-positive bacteria used in the present example (study of markers specificity) is given

5 in **table 2B**.

**Table 2B** Gram-negative bacteria

genus	species	strain reference
<i>Acinetobacter</i>	<i>baumanii</i>	ATCC 19606
<i>Acinetobacter</i>	<i>calcoaceticus</i>	DSMZ 1139D
<i>Bordetella</i>	<i>parapertussis</i>	Clinical
<i>Bordetella</i>	<i>bronchiseptica</i>	Clinical
<i>Bordetella</i>	<i>pertusis</i>	Clinical
<i>Brucella</i>	<i>melitensis biovar 1</i>	16M
<i>Brucella</i>	<i>melitensis biovar 2</i>	63/9
<i>Brucella</i>	<i>abortus biovar 1</i>	544
<i>Brucella</i>	<i>abortus biovar 2</i>	86/8/59
<i>Brucella</i>	<i>canis</i>	RM6/66
<i>Brucella</i>	<i>ovis</i>	63/290
<i>Brucella</i>	<i>suis biovar 1</i>	1330
<i>Brucella</i>	<i>suis biovar 2</i>	686
<i>Burkholderia</i>	<i>cepacia</i>	ATCC 17770
<i>Citrobacter</i>	<i>freundii</i>	DSMZ 30039
<i>Cryptococcus</i>	<i>neoformans</i>	DSMZ 70219
<i>Enterobacter</i>	<i>cloacae</i>	ATCC 13047
<i>Enterobacter</i>	<i>aerogenes</i>	DSMZ 13048
<i>Escherishia</i>	<i>coli O157:H7</i>	DSMZ 8579
<i>Escherishia</i>	<i>coli K12</i>	DSMZ 6367
<i>Francisella</i>	<i>tularensis</i>	SVA / T7
<i>Haemophilus</i>	<i>influenzae</i>	DSMZ 9999
<i>Haemophilus</i>	<i>ducrei</i>	-
<i>Klebsiella</i>	<i>pneumoniae</i>	ATCC 13883
<i>Klebsiella</i>	<i>oxytica</i>	ATCC 43863
<i>Legionella</i>	<i>pneumophila</i>	DSMZ 7513
<i>Moraxella</i>	<i>catarrhalis</i>	DSMZ 11994
<i>Morganella</i>	<i>morganii</i>	ATCC 25830
<i>Neisseria</i>	<i>meningitidis groupe C</i>	ISP ???
<i>Neisseria</i>	<i>meningitidis groupe B</i>	clinical
<i>Pasteurella</i>	<i>multocida</i>	-
<i>Proteus</i>	<i>mirabilis</i>	ATCC 29906
<i>Proteus</i>	<i>vulgaris</i>	ATCC 13315
<i>Providencia</i>	<i>stuartii</i>	ATCC 29914
<i>Pseudomonas</i>	<i>aeruginosa</i>	DSMZ 50071

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<i>Pseudomonas</i>	<i>putida</i>	ATCC 12633
<i>Pseudomonas</i>	<i>syringae</i>	ATCC 39254
<i>Salmonella</i>	<i>enteritidis</i>	Clinical
<i>Salmonella</i>	<i>enterica hadar</i>	Clinical
<i>Salmonella</i>	<i>enterica brandenburg</i>	Clinical
<i>Salmonella</i>	<i>enterica derby</i>	Clinical
<i>Salmonella</i>	<i>enterica virchow</i>	Clinical
<i>Salmonella</i>	<i>enterica typhimurium</i>	Clinical
<i>Salmonella</i>	<i>enterica paratyphi B</i>	Clinical
<i>Serratia</i>	<i>liquefasciens</i>	ATCC 27592
<i>Serratia</i>	<i>marcescens</i>	ATCC 13880
<i>Shigella</i>	<i>sonnei</i>	Clinical
<i>Shigella</i>	<i>flexneri</i>	-
<i>Vibrio</i>	<i>parahaemolyticus</i>	-
<i>Vibrio</i>	<i>cholerae</i>	-
<i>Yersinia</i>	<i>pestis</i>	-

The following sequences have been characterized and used for multigenotypic identification of Gram-negative bacteria.

5 The **HI1576 sequence** (marker VI) from *Haemophilus influenzae* corresponds to the gene coding for phosphoglucose isomerase (accession n° U32831, from position 12660 to 13991) an enzyme playing a role in glucidic metabolism especially for glycolysis (Morris *et al*, 2001).

10 Another sequence is the **Ecs0036 sequence** (marker V) from *Escherichia coli* O157:H7 (accession n° AP002550; from position 35200 to 36200). It is believed that this sequence encodes the large carbamoyl-synthetase unit, an enzyme which catalysis the synthesis of carbamoyl phosphate, from glutamine, bicarbonate and two ATP molecules through a mechanism which requires several successive steps (Raushel *et al*, 2001). The synthesized carbamoyl-phosphate contributes to *de novo* synthesis of pyrimidic bases in bacteria (Minic *et al*, 2001).

15 Another sequence is the **EG10839 & EG11396 (sfrB & yigC) sequence** (= marker VII) from *Escherichia coli* K12 (accession n° NC\_000913; from position 4022578 to 4024071). The corresponding protein is not yet known. When considering the sequence of the gene, it is a putative flavoprotein reductase. A search in DNA databases allowed us to find homologous sequences in some bacteria.

20 The **HI0019** (= marker VIII) sequence from *Haemophilus influenzae* (accession n° U32687, from position 7501 to 8550). This sequence shares all the characteristics of a coding sequence. However, the product of this coding sequence does not match any known

protein. This sequence is homologous to the gene coding for the hypothetical protein yleA from *Pasteurella multocida* (accession n° AF23940) whose function is totally unknown.

### Example 3 Additional molecular marker sequences

This example illustrates the determination of marker sequences homologous to the sequences Spy0160, Spy1372, SpyM3-0902 & SpyM3-0903, Spy1527, Ecs0036, HI1576, and EG10839 & EG11396 as defined above in other Gram-positive or Gram-negative bacteria. These marker sequences were obtained using sets of degenerated primers, which have been identified based on theoretical alignments of the above-defined marker sequence (see examples 1-2) with sequences available in DNA databases.

**Table 3A-H** represents some degenerated primer sequences that have been used to amplify homologous marker sequences present in other Gram-positive or Gram-negative bacteria. PCR amplification was done using the identified degenerated primers on bacterial DNA isolated from various other Gram-positive or Gram-negative bacteria. Amplification was done under conditions of low stringency. In **table 3A-H**, the conditions the PCR programs and applied temperatures are indicated.

**Table 3A** Target sequence: Homologs of Spy0160 (purA gene or Marker I) in Gram-positive bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GRP1-S	5'-YHTTTYGAAGGDGCDCAAGG-3' (SEQ ID NO: 462)	61°C	50°C	585 bp
GRP1-AS	5'-GRYCWGGMCCWACTGAGAA-3' (SEQ ID NO: 463)	59°C		

**Table 3B** Target sequence: Homologs of Spy1372 (pstI gene or Marker II) in Gram-positive bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GRP2-S	5'-CCNGCCATYTCWCCRCACAT-3' (SEQ ID NO: 464)	63°C	50°C	443 bp
GRP2-AS	5'-AMGARATGAAYCCRTTCYTDGG-3' (SEQ ID NO: 465)	64°C		

**Table 3C** Target sequence: Homologs of SpyM3\_0902 & SpyM3\_0903 (Marker III) in Gram-positive bacteria

Primers	Sequence	Tm	Annealing temperature	Amplicon size
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26

			during the PCR	
GRP3-S	5'-GACGGAMYTCTGGAGAGACC-3' (SEQ ID NO: 466)	57°C	48°C	around 600 bp
GRP3-AS	5'- GCRTAYTTDGTGCCATWCCAAA-3' (SEQ ID NO: 467)	59°C		

**Table 3D** Target sequence: Homologs of Spy1527 (typA gene-Marker IV) in Gram-positive bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GRP4-S	5'-GARCGTATYATGAAAATGGT-3' (SEQ ID NO: 468)	57°C	45°C	885 bp
GRP4-AS	5'-CATDCCYTCAGDCKCAT-3' (SEQ ID NO: 469)	59°C		

5 **Table 3E** Target sequence: Homologs of HI1576 (glucose-6-phosphate isomerase gene - marker VI) in Gram-negative bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GN-1-S	5'- TGGGTYGGYGGYCGTTACT-3' (SEQ ID NO: 470)	63°C	50°C	around 500 bp
GN-1-AS	5'- TCGGTYTGNGCRAAGAAGTT-3' (SEQ ID NO: 471)	64°C		

**Table 3F** Target sequence: Homologs of Ecs0036 (Carb-P, large subunit gene- or Marker V) in Gram-negative bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GN-2-S	5'-CSACNATYATGACYGAYCC-3' (SEQ ID NO: 472)	63°C	50°C	500-650 bp
GN-2-AS	5'-TCCATYTCRTAYTCYTTCCA-3' (SEQ ID NO: 473)	64°C		

10

**Table 3G** Target sequence: Homologs of EG10839 & EG11396 (sfrB & yigC or Marker VII) in Gram-negative bacteria

Primers	Sequence	Tm	Annealing temperature during the PCR	Amplicon size
GN-3-S	5'- AAYTTGGTRTACATRAACTG -3' (SEQ ID NO: 474)	63°C	50°C	Around 600 bp
GN-3-AS	5'- RVTGATYATGCGYTGCT-3' (SEQ ID NO: 475)	64°C		

**Table 3H** Target sequence: Homologs of HI0019 (yleA or Marker VIII) in Gram-negative bacteria

Primers	Sequence	T <sub>m</sub>	Annealing temperature during the PCR	Amplicon size
GN-4-S	5'- GCCNGGGAADCCNACRAT -3' (SEQ ID NO: 476)	63°C	60°C	Around 500 bp
GN-4-AS	5'- GTNTCNRTNATGGAAGGCTG-3' (SEQ ID NO: 477)	64°C		

An example of a PCR amplification used to obtain marker sequences from bacteria is as follows: 10 ng of genomic DNA from each bacterial strain tested is added to a mixture containing 10 mM Tris HCl pH 9, 2.5 mM MgCl<sub>2</sub>, 50 mM KCl, 0.1% Triton X-100 (v/v), 300 nM of each primer (forward and reverse; see **table 3** for primers used), 0.25 mM desoxynucleotides triphosphates (Roche Diagnostics, Mannheim, Germany), 2.5 U de Taq Polymerase Expand High Fidelity (Roche Diagnostics, Mannheim, Germany) in a final volume of 50 µl. Amplifications were carried out in a Mastercycler gradient (Applied Biosystem 2400, USA). An initial activation step of Expand High Fidelity (94°C for 3 min) is followed by 35 cycles (94°C for 40 s, annealing temperature equal to T<sub>m</sub> -5 or -10 °C for 50 s, 72°C for 1 min) and a final extension for 10 min.

Amplified DNA fragments were run on a 2% agarose gel stained with ethidium-bromide and visualized on a UV transilluminator.

**Figures 1-3** illustrate the amplification in some Gram-positive bacteria of molecular markers which are homologous to markers I to III respectively. **Figures 8 and 10** illustrate the amplification in some Gram-negative bacteria of molecular markers homologous to markers V (Ecs0036) and VI (HI1576) respectively. **Figures 4-7, 9 and 11-21** illustrate molecular marker sequences from different Gram-positive bacteria or Gram-negative bacteria.

#### Example 4 Use of an assay according to the invention for molecular identification of various *Bacillus* species and strains

The present example illustrates the use of an assay according to the invention for the molecular identification of various *Bacillus* species, including *Bacillus anthracis*, species that cannot be discriminated with ribosomal 16S rDNA gene (La Scola *et al*, 2003). **Table 4** summarizes the results obtained for the various *Bacillus* species with the current genotyping assay. The analyses were performed using the markers I, II and III. Marker I corresponds to the Spy0160 sequence, Marker II corresponds to the Spy1372 sequence, Marker III corresponds to the SpyM3\_0902 & Spy M3\_0903 sequence.



Primers were designed for these markers and with these primers DNA of *Bacillus* was amplified. Then, the obtained amplified sequences were sequenced and compared by alignment. **Table 4** indicates the number of modified nucleotides in the amplified marker sequences of these different *Bacillus* species and strains. The 16S ribosomal marker is not relevant in this context and cannot be used for identifying *Bacillus* species because the amplicons corresponding to each *Bacillus* species will give comparable nucleic acid sequences, with variations not exceeding 1% on the whole gene.

**Table 4** Use of different molecular markers for the identification of *Bacillus* species

	Molecular marker	<i>B. cereus</i> 10987	<i>B. cereus</i> 14579	<i>B. thuringiensis</i> 4Q2-72 israelensis	<i>B. anthracis</i> 1978
<i>B. cereus</i> 10987	Marker III (SEQ ID NO: 168)		8	29	29
	Marker I (SEQ ID NO: 18)		1	23	21
	Marker II (SEQ ID NO: 70)		2	3	11
	16S		0	0	ND
<i>B. cereus</i> 14579	Marker III (SEQ ID NO: 169)	8		32	31
	Marker I (SEQ ID NO: 19)	1		22	20
	Marker II (SEQ ID NO: 71)	2		5	13
	16S	0		0	ND
<i>B. thuringiensis</i> 4Q2-72 israelensis	Marker III (SEQ ID NO: 170)	29	32		12
	Marker I (SEQ ID NO: 33)	23	22		30
	Marker II (SEQ ID NO: 80)	3	5		12
	16S	0	0		ND
<i>B. anthracis</i> 1978	Marker III (SEQ ID NO: 162)	29	31	12	
	Marker I (SEQ ID NO: 12)	21	20	30	
	Marker II (SEQ ID NO: 64)	11	13	12	
	16S	ND	ND	ND	

ND = not determined

This example shows unambiguously that the combined use of several unrelated molecular markers markedly improves bacterial species identification, as well as, to some extent, characterization of a well-determined strain within a particular species. The present

method is so specific that it can go beyond the species identification and discriminate strains of the same species.

#### Example 5 Nucleic acid probes according to the present invention

This example illustrates an oligonucleotide (nucleic acid probe) that has been designed from marker I of *Staphylococcus aureus* (SEQ ID NO: 23) 5'-gtgtaggtcctacattcgtttc-3' (SEQ ID NO: 478). This oligonucleotide is specific for *S. aureus* species and can therefore allow discrimination of this species with other bacteria whereas another nucleic acid probe, the oligonucleotide 5'-cattcgtttcaaaggtaatg-3' (SEQ ID NO:479) which is located on the same marker allows discrimination of different strains of *S. aureus* (i.e. strains MRSA MW2 and MRSA COL versus strains Mu-50 and N315). These multi-resistant strains carry different methicillin resistance cassette chromosome and their resistance patterns to antimicrobials agents are different.

The illustrated nucleic acid probes can for instance advantageously be used in an assay according to the present invention, on a DNA chip according to the present invention. The two oligonucleotides provided above can be considered as specific probes which can be bound on a biochip and therefore allow discrimination between various amplicons obtained from MRSA strains amplified with the primers of **table 3**.

#### **Conclusion**

The present invention demonstrates that multigenotypic molecular analyses according to Gram-, genus- species- and strain-specificity can be achieved by using concomitantly or sequentially a panel of distinct conserved molecular markers, either by conventional polymerase chain reaction PCR (with exploitation of single nucleotide specific polymorphism or SNP) , real-time PCR (with/without specific Taqman probes), or post-PCR reverse hybridization on solid support (micro-, macro- or nano-array). The analyses allow a fast and specific detection of bacterial DNA and a wide bacterial genotyping in human, animal or environmental samples.

The combined use of the herein described molecular markers allows rapid and specific molecular identification of a wide panel of bacteria in samples and/or tissues, even in samples showing a background bacterial flora. To the applicant's knowledge, there is no such diagnostic tool that is based on the use of a panel of various highly conserved bacterial molecular markers for detecting and identifying bacteria according to Gram-, genus-, species-, and to some extent also strain- classification. Compared to the existing typing systems, we believe that this is a major improvement, in view of the increased need for rapid

and multigenotypic bacterial diagnoses, especially when considering nosocomial infections and epidemic bacterial diseases occurring in a natural, accidental or criminal setting. To this respect, molecular typing of bacteria according to the Gram phenotype is of particular interest when appropriate antibiotherapy has to be rapidly started.

5

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**Claims**

1. An assay for detecting and identifying one or more micro-organisms in a sample, characterized in that said assay comprises the use of at least two conserved molecular markers.  
5
2. Assay according to claim 1, characterized in that said micro-organisms are bacteria.
3. Assay according to claims 1 or 2, characterized in that said assay comprises the use of at least one molecular marker that is conserved in Gram-positive bacteria and at least one molecular marker that is conserved in Gram-negative bacteria.  
10
4. Assay according to any of claims 1 to 3, characterized in that said molecular marker that is conserved in Gram-positive bacteria is selected from the group comprising the Spy0160, Spy1372, SpyM3\_0902 and SpyM3\_0903, and Spy1527 sequences.  
15
5. Assay according to any of claims 1 to 3, characterized in that said molecular marker that is conserved in Gram-positive bacteria is selected from the group comprising the sequences with SEQ ID NOs 1-62, 64-107, 109-111, 117-129, 137, 145-148, 150-193, 233-237, 240-241, 255, 326-395, 397-399, 404-425.  
20
6. Assay according to any of claims 1 to 3, characterized in that said molecular marker that is conserved in Gram-negative bacteria is selected from the group comprising the Ecs0036, HI1576, EG10839 and EG11396, and HI0019 sequences.  
25
7. Assay according to any of claims 1 to 3, characterized in that said molecular marker that is conserved in Gram-negative bacteria is selected from the group comprising the sequences with SEQ ID NOs 63, 108, 112-116, 130-136, 138-144, 194-232, 238-239, 242-254, 256-325, 396, 400-403, 426-461.  
30
8. Use of an assay according to any of claims 1 to 7 for diagnosing bacterial infection of a sample.
9. A primer pair suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5.  
35

10. A primer pair suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria as defined in any of claims 6 or 7.

5 11. A nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5.

12. A nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.

10

13. A composition comprising at least one primer pair suitable for amplifying a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5, and at least one primer pair suitable for amplifying a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.

15

14. A composition comprising at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5 and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7.

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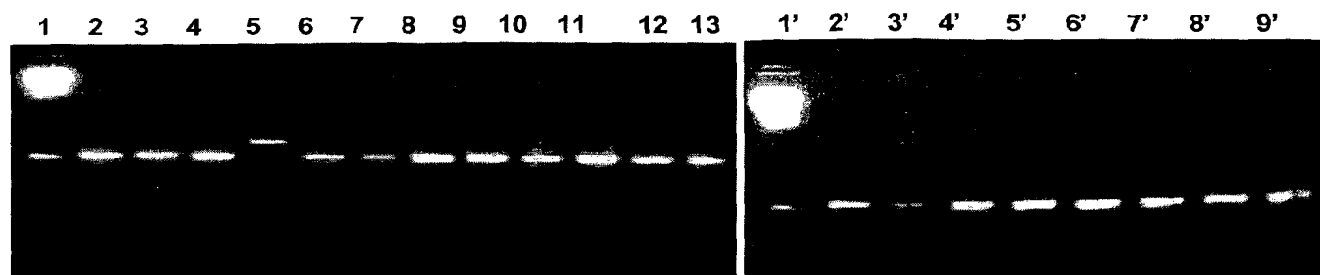
15. A kit for detecting and identifying one or more micro-organisms, preferably bacteria, in a sample, which comprises a composition according to claim 13 and/or claim 14.

25

16. A DNA chip in which at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-positive bacteria as defined in claims 4 or 5, and at least one nucleic acid probe capable of hybridizing to a molecular marker that is conserved in Gram-negative bacteria as defined in claims 6 or 7, is immobilized on a solid support.

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**Figure 1 Amplification of molecular marker I (pur A) in Gram-positive bacteria**

1 = DNA Ladder ( $\lambda$ /Hind III)

2 : *Streptococcus pyogenes*

3. *Streptococcus pneumoniae*

4. *Streptococcus oralis*

5. *Enterococcus hirae*

6. *Enterococcus casseliflavus*

7. *Streptococcus agalactiae*

8. *Streptococcus sanguis*

9. *Enterococcus faecalis*

10. *Enterococcus gallinarum*

11. *Enterococcus faecium*

12. *Enterococcus flavescens*

13. *Enterococcus durans*

1' : DNA Ladder ( $\lambda$ /Hind III)

2' : *Enterococcus raffinosus*

3' : *Enterococcus villorum*

4' : *Staphylococcus aureus*

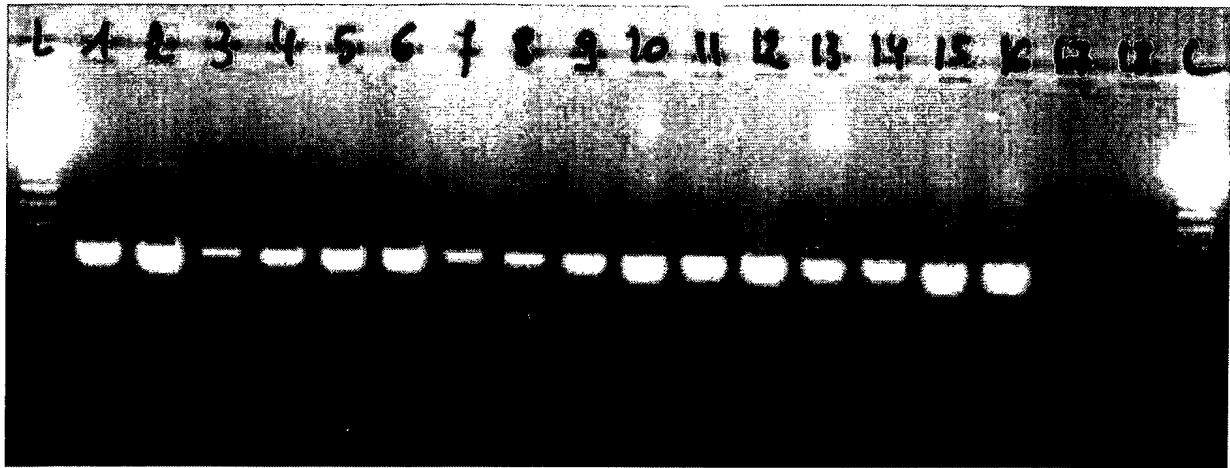
5' : *Staph. epidermidis*

6' : *Staphylococcus hominis*

7' : *Bacillus anthracis*

8' : *Bacillus cereus*

9' : *Bacillus megatherium*

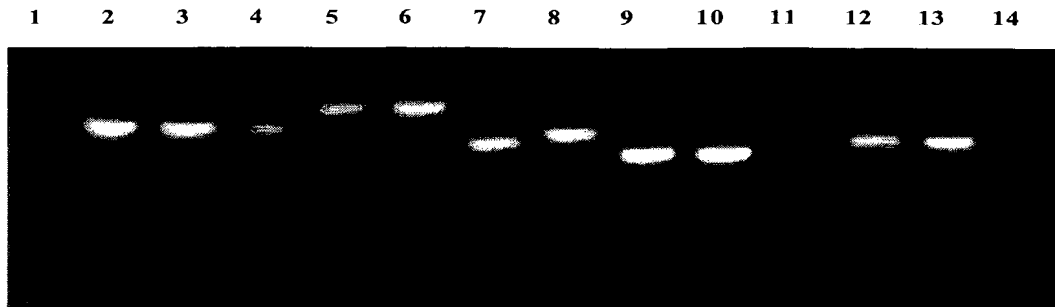
**Figure 2. Amplification of molecular marker II (ptsI) in Gram-positive bacteria**

L = DNA ladder (123 bp)

1. *Bacillus anthracis*
2. *Bacillus cereus*
3. *Listeria monocytogenes*
4. *Bacillus subtilis*
5. *Streptococcus pneumoniae*
6. *Streptococcus pyogenes*
7. *Streptococcus agalactiae*
8. *Streptococcus mutans*
9. *Enterococcus faecalis*
10. *Staphylococcus aureus*
11. *Staphylococcus epidermidis*
12. *Bacillus thuringensis*
13. *Staphylococcus hominis*
14. *Enterococcus faecium*
15. *Clostridium perfringens*
16. *Bacillus mycoides*
17. Negative control
18. Negative control



**Figure 3. Amplification of molecular marker III (SpyM3\_0902- SpyM3\_0903) in Gram-positive bacteria**



1. DNA Ladder
- 2 : *Streptococcus pyogenes*
3. *Streptococcus pneumoniae*
4. *Enterococcus faecalis*
5. *Streptococcus agalactiae*
6. *Streptococcus sanguis*
7. *Enterococcus casseliflavus*
8. *Streptococcus oralis*
9. *Bacillus anthracis*
10. *Bacillus cereus*
11. *Enterococcus raffinosus*
12. *Enterococcus gallinarum*
13. *Enterococcus flavescens*
14. Negative control of PCR.

**Figure 4: Marker I (PurA) sequences amplified from different Gram positive bacteria (SEQ ID NOs 1-62), and from a Gram-negative bacterium (SEQ ID NO: 63)**

**1. *Enterococcus faecalis* (SEQ ID NO. 1)**

**EFCL**

CTATTTGAAGGGCGCAAGGTGTCATGTTGGATATCGATCAAGGAACCTATCCATTTGTTACTTCTCTAATCCAG  
TAGCTGGTGGCGTAACTATCGGTAGTGGCGTTGGTCCATCAAAAATTAATAAAGTGGTTGGTGTCTGCAAAGCGT  
ACACTTCACGTGTCGGTGACGGCCCATTCCTCAACAGAATTATTTGATGAAACAGGAGAAACCATTCGTCGTGTCTG  
GTAAAGAATACGGAACAACAACAGGACGTCGCGCTCGTGTCTGGTTGGTTTGATTTCAGTAGTCATGCGTCATTCAA  
AACGTGTATCAGGGATTACAAACTTGTCTTAACTCGATTGACGTGTTAAGTGGTTTAGAAACGGTGAAAATTT  
GTACAGCTTATGAACTTGATGGTGAATTAATTTATCATTATCCAGCAAGCTTGAAAGAATTAAGCCGCTGTAAAC  
CAGTTTATGAAGAATTACCAGGTTGGTCTGAAGATATCACTGGTTGCAAACTTTAGCCGATTTACCAGCTAATG  
CTCGTAACTATGTGCATCGGATTTAGAATTAGTTGGTGTGCGCATTTCAACATTCTCAGTAGGGCCAGACC

**2. *Enterococcus gallinarum* (SEQ ID NO. 2)**

**EGAL**

CTCTTCGAGGTGCGCAAGGAGTTATGCTAGATATTGATCAAGGAACATATCCGTTTCGTAACATCCTCAAATCCAG  
TAGCTGGTGGAGTAACCATTTGGTAGTGGAGTGGGTCTTCTAAAATCAATAAAGTAGTTGGTGTGTTGTAAAGCAT  
ATACTTCAAGAGTTGGTGACGGCCCATTCCTCAACAGAACTTTTTGATGAAACAGGCAATCAAATTCGTGAAGTTG  
GCCGTGAATATGGTACGACAACCTGGTCTGACGTCGTGTTGGTTGGTTTGAATCTGTTGTCTATGCGTCATTCAA  
AACGTGTTTCTGGTATCACGAATCTGTCTTTAAATTCAATTGATGTTTTGAGCGGCTTGGAACCTGTAAAAATTT  
GTACTGCTTATGAATTAGATGGAGAATTGATTTATCATTATCCTGCAAGTCTAAAAGAATTGAATCGTTGTAAAC  
CAGTCTATGAAGAGTTACCAGGCTGGTCAGAAGATATTACTGGATGCAAAACATTAGCTGATCTTCTGAAATG  
CACGTAACCTATGTACATCGTATCTCTGAATTAGTTGGGGTTTCGTATCTCAACATTCTCAGTAGGTCTCTGACC

**3. *Enterococcus flavescens* (SEQ ID NO. 3)**

**EFLA**

CTTTTTGAAGGTGCTCAAGGCGTGATGCTGGATATCGACCAAGGAACCTATCCTTTTCGTGACATCATCCAACCCC  
GTTGCTGGGGGAGTCACTATTGGTAGTGGTGTGGGTCTTCAAAAATCAACAAAGTCGTTGGTGTCTGCAAAGCT  
TACACCTCTCGGGTAGGAGATGGTCCTTTCCCAACGGAAGTGTGATGAAACAGGTGAACAAATCCGTAAGATC  
GGTCGTGAATACGGAACAACGACAGGACGTCCTCGCCGTGTGGGCTGGTTTGATACCGTCGTGATGCGCCATTCA  
AAACGTGTTTCAGGGATTACAAACCTATCCCTTAACTCGATCGATGTCTTGAGCGGCTTAGAAACCGTGAAAGATC  
TGTACGGCTTATGAACTAGACGGCGAATTGATCTATCATTACCCAGCAAGCTTGAAAGAGTTGAACCGCTGCAAA  
CCAGTCTACGAAGAACTTCCTGGCTGGTCTGAAGACATTACTGGCTGCAAAACATTAGCAGATCTGCCAGAAAAAT  
GCACGCAATTACGTTACCCGCATCTCTGAATTAGTCGGTGTCCGCATTTTCGACCTTCTCAGTAGGGCCNGACC

**4. *Streptococcus agalactiae* (SEQ ID NO. 4)**

**SAGA**

CTCTTTGAAGGGCGCAAGGAGTTATGCTCGACATTGATCAAGGAACATACCCATTTGTAACATCTTCCAATCCAG  
TAGCAGGTGGTGTACAATTGGTTCGGGAGTTGGACCAAGTAAAATTAATAAAGTAGTAGGTGTATGTAAAGCTT  
ACACTAGCCGTGTTGGTGTATGGACCATTCCTCAACAGAAGTGTGATGAGGTTGGTGACCGTATTTCGTGAGATTG  
GTAAAGAGTATGGTACAACGACCGGTGCTCTCGTCGCGTTGGATGGTTTGATTCTGTTGTTATGCGTCACAGCC

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GTCGAGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTTCAGGGCTTGATACGGTGAAAATTT  
GTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAGCCTTGAACAGCTAAAACGTTGTAAAC  
CAATCTATGAAGAATTACCGGGCTGGTCTGAAGATATTACAGCTTGTCGTAGCTTAGATGATCTTCCAGAAAATG  
CACGTAATTACGTTCCCGTGTTGGCGAATTGGTTGGTGTTCGTATTTCTACTTTNCTCAGTAGGNCCAGGTC

**5. *Streptococcus sanguis* (SEQ ID NO. 5)****SSAN**

CTTTTTGAAGGGGCTCAAGGAGTTATGCTCGACATTGATCAAGGAACATACCCATTTGTAACATCTTCCAATCCA  
GTAGCAGGTGGTGTCACAATTGGTTCGGGAGTTGGACCAAGTAAAATTAATAAAGTAGTAGGTGTATGTAAAGCT  
TACACTAGCCGTGTTGGTGATGGACCATCCCAACAGAACTTTTTGATGAGGTTGGTGACCGTATTCGTGAGATT  
GGTAAAGAGTATGGTACAACGACCGGTCGTCTCGTCGCTGGATGGTTTGATTCTGTTGTTATGCGTCACAGC  
CGTCGAGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTTCAGGGCTTGATACGGTGAAAATT  
TGTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAGCCTTGAACAGCTAAAACGTTGTAAA  
CCAATCTATGAAGAATTACCGGGCTGGTCTGAAGATATTACAGCTTGTCGTAGCTTAGATGATCTTCCAGAAAAT  
GCACGTAATTACGTTCCCGTGTTGGCGAATTGGTTGGTGTTCGTATTTCTACTTTCTCAGTTGGGTCCAGACC

**6. *Enterococcus faecium* (SEQ ID NO. 6)****EFCM**

TTCTTCGAAGGGGCGCAAGGGGTTATGCTGGATATTGACCAAGGGACTTATCCATTTGTAACCTTCTTCTAATCCA  
GTTGCAGGGGAGTCACCATCGGTTCCGGTGTTGGTCCGAGCAAAATTGACAAGGTAGTTGGTGTCTGCAAGGCCT  
ACACCAGTCGGGTCGGAGATGGACCATTCCTCAACAGAGCTTTTTGATGAAGTTGGTGACCGCATTCGTGATATCG  
GCCACGAATATGGCACTACCACTGGTCGCCACGTCGGGTAGGTTGGTTTGACTCGGTTGTTATGCGCCATAGCC  
GCCGTGTATCAGGGATTACCAATCTTTCGCTTAACTCCATCGATGTCTTGAGTGGTCTGGATACAGTGAAAATCT  
GTGTAGCTTATGACTTGGATGGCCAAAGAATCGACCACTACCCAGCTAGTCTGGAACAGCTCAAGCGCTGCAAGC  
CGATTTACGAAGAGCTGCCAGGCTGGTCAGAGGACATCACTGGAGTCCGCAGTCTGGAAGACTTGCCAGAAAATG  
CCCGTAACTATGTTCCCGAGTGAGTGAGCTGGTTGGCGTTCGCATTTCTACCTTNCTCAGTAGGGCCAGACC

**7. *Enterococcus durans* (SEQ ID NO. 7)****EDUR**

CTCTTTGAAGGGGCACAAGGTGTGATGTTGGATATCGATCAAGGAACGTATCCATTTGTGACTTCTTCTAATCCG  
GTAGCTGGTGGTGTAAACGATCGGTAGTGGCGTTGGCCCTTCAAAGATCAATAAAGTCGTTGGTGTATGTAAAGCT  
TATACTTCTCGTGTAGGAGATGGCCCATTCCTCAACAGAACTATTTGACGAAACAGGTCAACAAATCCGTGAAGTC  
GGTCGTGAATATGGTACGACAACAGGTCGACCTCGTCGTGTCGTTGGTTTGATACAGTCGTGGTGCGCCATTCA  
AAACGTGTATCAGGAATCACTAACCTATCATTGAATTCAATCGATGTATTAAGCGGACTAGAAACAGTAAAAATC  
TGTACAGCGTATGAATTAGATGGAGAATTGATCTATCATTACCCAGCAAGCCTGAAAGAATTGAAACGTTGCAAA  
CCAGTATACGAAGAACTTCTTGGTTGGTCTGAAGATATTACAGCATGTAAAACACTTGCTGAACTACCAGAAAAC  
GCCCCTAACTATGTTAGACGTATCTCAGAGCCTGTAGGAGTCCGTATTTCAACATTCTCAGTAGGTCCAGACC

**8. *Streptococcus pyogenes* (SEQ ID NO. 8)****SPYO**

CTATTTGAAGGGGCACAAGGGGTTATGCTTGATATTGACCAGGAACGTACCCATTTGTAACGTCTTCAAACCCAG  
TTGCTGGTGGTGTAAACCATTTGGTTCTGGTGTGGCCCAATAAAATCAACAAAGTAGTTGGTGTCTGTAAAGCCT  
ACACAAGCCGTGTCGGTGATGGGCCATTCCCTACAGAACTCTTTGATGAAGTGGGTGAGCGCATTCGTGAAGTGG  
GTCATGAGTACGGGACAACGACCGGCCGTCCACGTCGTGTCGTTGGTTTGATTGGTTGTCATGCGCCACAGTC

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GTCGTGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTCAGGGCTTGATACGGTTAAGATTT  
GTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAACCTTGAACAACCTCAAACGTTGCAAAC  
CAATCTATGAAGAATTACCAGGCTGGCAAGAGGACATCACAGGTGTTTCGTAGCCTTGATGAGCTTCCTGAAAATG  
CCCGCAACTACGTTTCGTTCGTGTTGGAGAATTGGTTGGCGTTCGCATTTCAACCTTCTCAGTTGGGCCAGACC

**9. *Streptococcus pneumoniae*****(SEQ ID NO. 9)****SPNE**

CTATTTGAAGGGGCTCAAGGTGTTATGCTAGATATCGACCAAGGTACTTATCCATTTGTTACGTCATCAAACCTT  
GTAGCTGGTGGTGTGACAATTGGTTCTGGTGTCCGCTCCAAGCAAGATTGACAAGGTTGTAGGTGTATGTAAAGCT  
TATACGAGTCGTGTAGGAGATGGTCCTTTCCCAACTGAGTTGTTTGATGAAGTGGGAGAACGTATCCGTGAAGTG  
GGTCATGAATATGGTACAACAACCTGGTTCGTCCACGTCGTGTAGGTTGGTTTGACTCAGTTGTGATGCGTCATAGC  
CGTCGTGTTTTCTGGTATTACTAACCTTTCTTTGAACTCTATTGATGTTTTGAGCGGTTTGGATACTGTGAAAATC  
TGTGTGGCCTATGATCTTGACGGTCAACGTATTGACTACTATCCAGCTAGTCTTGAGCAATTGAAACGTTGCAAG  
CCTATCTATGAAGAGTTGCCAGGTTGGTCAGAAGATATTACCGGAGTTCGCAATTTGGAAGATCTTCCTGAGAAT  
GCGCGTAACTATGTTTCGTTCGTGTGAGTGAATTGGTTGGCGTTCGTATTTCTACTTTTCTCAGTAGGTCCAGGCC

**10. *Streptococcus oralis* (SEQ ID NO. 10)****SORA**

CTTTTCGAAGGTGCGCAAGGTGTCATGTTGGACATTGATCAAGGGACTTATCCATTTGTTACTTCTTCAAACCTT  
GTCGCTGGTGGTGTGACGATTGGGTCTGGTGTGGTCCAAGTAAGATTGACAAGGTTGTAGGTGTCTGTAAAGCC  
TACACAAGTCGTGTAGGAGATGGACCGTTCCCAACTGAATTATTTGATGAAGTGGGAGATCGCATCCGTGAAGTA  
GGTCATGAATATGGTACAACAACCTGGTTCGTCCACGTCGTGTGGGTTGGTTTGACTCAGTTGTGATGCGTCACAGC  
CGCCGTGTATCTGGGATTACCAATCTTTCAATTGAACTCTATAGATGTTTTGAGTGGTTTGGATACTGTGAAAATC  
TGTGTGCGCTATGATCTTGATGGTCAACGTATTGATTACTATCCTGCTAGTCTTGAGCAGTTGAAACGTTGTAAG  
CCAATCTACGAGGAATTGCCAGGTTGGTCAGAAGACATCACTGGAGTCCGTAATTTGGAAGACCTTCCTGAGAAT  
GCACGCAACTATGTTTCGTTCGTGTAAGCGAGTTGGTTGGTGTTCGTATCTCAACTTTCTCAGTTGGGCCAGATC

**11. *Staphylococcus hominis* (SEQ ID NO. 11)****SHOM**

CTCTTTGAAGGAGCGCAAGGAGTTATGTTAGATATCGACCATGGTACATATCCTTTTGTAACGTCAAGTAATCCT  
GTGGCAGGTAATGTGACAGTAGGAACCTGGCGTGGGTCCAACCTTCGTATCTAAAGTGATTGGGGTATGTAAATCC  
TATACATCTCGTGTAGGTGACGGCCCATTCCTACTGAATTATTCGACGAAGATGGTCATCATATTAGAGAAGTA  
GGTCGTGAATATGGAACGACAACAGGACGTCTCGTCGTGTAGGTTGGTTCGACTCAGTTGTATTACGTCACTCT  
CGTCGTGTAAGTGGTATTACAGACTTATCTATTAACCTCAATTGACGTTTTTAACAGGTTTAGATACGGTTAAATT  
TGTACAGCTTATGAGTTAGATGGTGAAACAATCACAGAATATCCAGCAAACCTTAGACCAATTACGTCGTTGTAAA  
CCAATTTTCGAAGAGTTACCTGGTTGGACGGAAGACATTACAGGTTGTCGTACATTAGAAGAATTACCTGAAAAC  
GCACGTAAATACTTAGAACGTATTTCTGAATTATGTGGCGTTCATATTTCAATCTTCTCAGTAGGTCCAGGCC

**12. *Bacillus anthracis* 1978 (SEQ ID NO. 12)**

GCTTCANTCGACCCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAACCTG  
GAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCAT  
TCCCTACTGAGCTTCATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACCTGGTC  
GTCCACGCCGCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTAT

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CATTAAACTCTATCGACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAAG  
TTATCGATGAAGTTCCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGGA  
CAGAAGATATTACTGGTGTAAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTG  
AGTTAACAGGAATTCAATTATCTATGTTCTCAGTG

**13. *Bacillus anthracis* Butare (SEQ ID NO. 13)**

GCTTGCTATCGACCCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAAC  
GGAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCA  
TTCCCTACTGAGCTTCATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACTGGT  
CGTCCACGCCGCGTAGGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTA  
TCATTAAACTCTATCGACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAA  
GTTATCGATGAAGTTCCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGG  
ACAGAAGATATTACTGGTGTAAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCT  
GAGTTAACAGGAATTCAATTATCTATGTTCTCGTG

**14. *Bacillus anthracis* Sterne (SEQ ID NO. 14)**

CTTCGACNCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTT  
GGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCT  
ACTGAGCTTCATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACTGGTCGTCCA  
CGCCGCGTAGGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTATCATTA  
AACTCTATCGACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAAGTTATC  
GATGAAGTTCCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGGACAGAA  
GATATTACTGGTGTAAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTA  
ACAGGAATTCAATTATCTATGTTCTCAGTGGCCCC

**15. *Bacillus anthracis* 1655H85 (SEQ ID NO. 15)**

GGTNCGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCTGCG  
AAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTGAGCTT  
CATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACTGGTCGTCCACGCCGCGTA  
GGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTATCATTAAGTCTATC  
GACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAAGTTATCGATGAAGTT  
CCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGGACAGAAGATATTACT  
GGTGTAAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAATT  
CAATTATCTATGTTCTCAGTGGCCCCNNGNCCNAN

**16. *Bacillus anthracis* Coda-cerva (SEQ ID NO. 16)**

GGTNCGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCTGCG  
AAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTGAGCTT  
CATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACTGGTCGTCCACGCCGCGTA  
GGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTATCATTAAGTCTATC

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GACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAAGTTATCGATGAAGTT  
CCAGCAAACCTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGGACAGAAGATATTACT  
GGTGTAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAATT  
CAATTATCTATGTTCTCAGTGGCCCCNNGGNCCCA

**17. *Bacillus anthracis* 2054H82 (SEQ ID NO. 17)**

NGCTTNAATCGACCCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAAC  
GGAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCA  
TTCCCTACTGAGCTTCATGACGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACTGGT  
CGTCCACGCCGCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTA  
TCATTAAACTCTATCGACGTTCTAACTGGTATTCCAACACTTAAAATTTGTGTTGCTTACAAATGCGATGGGAAA  
GTTATCGATGAAGTTCCAGCAAACCTAAACATTTTAGCGAAATGTGAGCCTGTATACGAAGAGCTTCCAGGTTGG  
ACAGAAGATATTACTGGTGTAAAGATCATTAGATGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCT  
GAGTTAACAGGAATTCAATTATCTATGTTCTCAGT

**18. *Bacillus cereus* ATCC 10987 (SEQ ID NO. 18) BCER10987**

GNCNCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGCGGTGTAAACAGTTGGAACCTGGAGTTGGTC  
CTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTG  
AGCTTCATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGCGAGTATGGAACGACAACTGGTCGTCCACGCC  
GCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACGATCTATCATTAAATT  
CTATCGACGTTTTAACAGGTATTCCAACCTTAAAATTTGTGTAGCTTACAAATACAATGGCGAAGTTATTGATG  
AAGTTCCAGCTAACTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGGAAGAAGATA  
TTACTGGTGTAAAATCATTAGATGAACTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAG  
GAATTCAAATATCTATGTTCTCAGTAGNCCCC

**19. *Bacillus cereus* ATCC 14579 (SEQ ID NO. 19) BCER14579**

GGTCGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCTGCGA  
AAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTGAGCTTC  
ATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGCGAGTATGGAACGACAACTGGTCGTCCACGCCGCGTAG  
GTTGGTTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACGATCTATCATTAAATTCTATCG  
ACGTTTTAACAGGTATTCCAACCTTAAAATTTGTGTAGCTTACAAATACAATGGCGAAGTTATTGATGAAGTTC  
CAGCTAACTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGGAAGAAGATATTACTG  
GTGTAAAATCATTAGATGAACTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAATTC  
AAATATCTATGTTCTCAGTNGGCCCC

**20. *Bacillus megatherium* (SEQ ID NO. 20)**

**BMEG**

CTATTCGAAGGGGCACAAGGTGTTATGTTAGATATCGATCAAGGAACATATCCATTGTTACATCTTCAAACCCA  
GTAGCGGGTGGAGTAACAATTGGTTCTGGGGTAGGTCCATCTAAAATCAAACACGTTGTAGGTGTATCAAAAGCG  
TATACAACTCGTGTGGTGACGGCCCTTTCCCAACTGAATTAACAAACGAAATCGGTGATCAAATCCGTGAAGTA  
GGACGTGAATATGGTACAACAACCTGGTCGTCTCGCCGTGTAGGTTGGTTCGACAGTGTAGTTGTACGTCATGCT

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CGTCGCGTTAGTGAATCACAGATCTATCTTTAACTCAATTGATGTATTAACGGGAATTGAGACATTAAAGATT  
TGCGTAGCTTATCGTTATAAAGGGGAAGTTATGGAAGAATTCCCTGCTAGCTTAAAAACACTTGACAGAGTGCGAA  
CCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACGGGTGTGAAAACATTAGATGAGTTACCTGATAAC  
GCTCGCCACTACTTAGAGCGCGTGTCTCAATTAACAGGTATTCCTTTATCTATTTTCTCAGTAGGTCCAGGCC

**21. *Enterococcus casseliflavus* (SEQ ID NO. 21) ECAS**

TATTCGAAGGNAGCTCAAGGCGTGATGCTGGATATCGACCAAGGAACCTATCCTTTCGTGACATCATCCAACCCC  
GTTGCTGGAGGTGTCAACATCGGTAGTGGTGTGGGTCTTCAAAAATCAACAAAGTCGTTGGTGTCTGCAAAGCT  
TACACCTCTCGGGTAGGAGATGGTCCTTTCCCAACGGAACGTGTTTGATGAAACAGGTGAACAAATTCGTAAGATC  
GGTCGTGAATACGGAACAACGACAGGACGTCCTCGCCGTGTGGGCTGGTTTGATACCGTCGTGATGCGCCATTCA  
AAACGGGTCTCAGGGATCACGAATCTATCCCTTAACTCGATCGATGTCTTGAGCGGCTTAGAAACCGTGAAGATC  
TGTACGGCTTATGAACTAGACGGCGAATTGATCTATCATTACCCAGCAAGCTTGAAAGAGTTGAACCGCTGCAAA  
CCAGTCTACGAAGAACTTCTTGGCTGGTCTGAAGACATTACTGGCTGCAAAACATTAGCAGATCTGCCAGAAAAT  
GCACGCAATTACGTTCAACGCATCTCTGAATTAGTCGGTGTCCGCATTTTCGACCTTCTCAGTAGGTCCAGACC

**22. *Enterococcus raffinosus* (SEQ ID NO. 22) ERAF**

CTATTTGAAGGTGCTCAAGGCGTTATGCTGGATATTGATCAAGGAACCTATCCATTTGTTACTTCTTGAACCCA  
GTTGCCGGTGGGGTAACTATCGGTAGTGGTGTAGGACCTGCTAAAATCGACAAAGTTGTCGGTGTGTTGTAAAGCC  
TATACTTCACGCGTAGGTGATGGACCTTTCCCAACTGAATTGTTTGATGAAGTTGGAGATCAGATTCGTGAAGTC  
GGTCGTGAATATGGAACGACTACTGGTCGTCCACGTCGTGTGGGCTGGTTTGACTCGGTTGTGATGCGTCATTCA  
AAACGTGTTTCTGGGATTACGAATCTTTCTTTAACTCGATTGATGTCTTGAGCGGTCTGGATACAGTGAAAATT  
TGTACAGCGTATGAGCTGGACGGAGAACTAATTTACCATTATCCAGCAAGCCTAAAAGAATTAATCGTTGTAAG  
CCCGTTTATGAAGAACTACCTGGTTGGAGCGAAGATATTACAGGCTGCCGTGATTTAGCTGATCTACCGGAAAAT  
GCGCGTAATTATGTACGTCGCGTTTCTGAACTTGTGGGTGTGCGTATCTCGACCTTCTCAGTTGGTCCTGGTC

**23. *Staphylococcus aureus* (SEQ ID NO. 23) SAUR**

CTATTTGAAGGGGCACAAGGTGTAATGTTAGATATCGACCATGGTACATATCCATTCGTTACATCAAGTAATCCA  
ATTGCAGGTAACGTTACTGTTGGTACAGGTGTAGGTCCTACATTCGTTTCAAAGGTAATTGGTGTATGTAAAGCT  
TATACATCACGTGTTGGTGTGATGGTCCATTCCCTACTGAATTATTCGATGAAGATGGACATCATATTAGAGAAGTT  
GGTCGTGAATATGGTACAACAACAGGACGTCCACGTCGTGTAGGTTGGTTTGATTGAGTTGTATTACGTCACCTCT  
CGTCGTGTAAGTGGTATTACAGATTTATCTATTAACCTCAATCGATGTTTTAACAGGCCTAGACACAGTGAAAATC  
TGTACAGCTTATGAATTAGACGGTAAAGAAATTACTGAGTACCCAGCAAACTTAGATCAATTAAAACGTTGTAAA  
CCAATCTTTGAAGAGTTACCAGGTTGGACAGAAGACGTAACAAGTGTGCGTACTTTAGAAGAATTACCTGAAAAT  
GCACGTAAATATTTAGAGCGTATTTTCAGAATTATGTAATGTACAAATTTCTATCTTCTCAGTAGGTCCAGGCC

**24. *Staphylococcus epidermidis* (SEQ ID NO. 24) SEPI**

CTCTTCGAAGGTGCTCAAGGTGTCATGTTAGATATCGACCATGGTACATATCCATTCGTTACATCTAGTAATCCA  
GTTGCAGGTAACGTTACAGTAGGTACAGGTGTTGGCCCTACATCAGTGTCTAAAGTGATTGGTGTATGTAAATCA  
TATACATCTCGTGTAGGTGACGGTCCATTCCCAACTGAACTTTTTGATGAAGATGGCCACCATATTAGAGAAGTG  
GGTCGTGAATATGGTACAACACTACTGGACGTCCACGTCGTGTAGGTTGGTTTCGACTCAGTTGTATTACGTCATTCA

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CGTCGTGTAAGTGGTATCACAGATCTTTCAATTAACCAATCGACGTTTTAACAGGATTAGACACAGTTAAAATT  
TGTAAGTCTTACGAATTAGATGGTGAAAAAATTACTGAATACCCAGCAAACCTTAGATCAATTAAGACGTTGTAAA  
CCTATCTTCGAAGAGCTTCCAGGTTGGACTGAAGACATTACAGGTTGTCGTAGTTTAGATGAACTTCCTGAGAAT  
GCACGTAATTACTTAGAGCGTATTTTCAGAAATTATGCGGTGTCCATATTTCAATCTTCTCAGTAGGTCCTGGTC

**25.        *Streptococcus mitis*        (SEQ ID NO. 25)        SMIT**

TATGGCTAGCNATAGACCAAGGTACGTATCCATTTGTTACGTCATCAAACCTGTGGCTGGTGGTGTACGATTG  
GTTCTGGTGTGGTCCAAGTAAGATTGACAAGGTTGTAGGTTTATGTAAAGCCTATACGAGTCGAGTAGGAGACG  
GTCCTTTCCCAACTGAATTGTTTGATGAAGTGGGAGAACGTATCCGTGAAGTTGGTCATGAATATGGTACAACAA  
CTGGTCGTCCACGTCGTGTGGGTTGGTTTGACTCAGTTGTGATGCGTCATAGTCGTGCTGTTTCTGGTATTACTA  
ATCTTTTCATTGAACCTCTATCGATGTTTTGAGTGGTTTAGATACAGTGAAAATCTGTGTGGCCTATGATCTTGATG  
GTCAACGTATTGACTACTATCCAGCTAGTCTTGAGCAATTGAAACGTTGCAAGCCTATCTATGAAGAGTTGCCAG  
GTTGGTCAGAAGATATTACTGGAGTTCGTAATTTGGAAGATCTTCCTGAGAATGCGCGTAACCTATGTTTCGTGCTG  
TGAGTGAATTGGTTGGCGTTCGTATTTCTACTTTCTCAGTAG

**26.        *Streptococcus species* (SEQ ID NO. 26)        SSPE**

ATGGCTTGCTATTGACCAAGGGTACATACCCATTTGTAACATCATCTAACCCAGTCGCTGGTGGTGTAAACAATCG  
GTTCTGGTGTGGTCCAAGTAAATCAACAAAGTTGTCGGTGTATGTAAAGCCTACACAAGCCGTGTTGGTGACG  
GACCATTCCCAACTGAACTTTTAGACGAAGTTGGTGACCGCATCCGTGAAGTGGGTACGAATATGGGACAACAA  
CTGGACGTCCACGTCGTGTTGGTTGGTTTGACTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGTATCACAA  
ACTTGTCACCTAACTCAATTGACGTTCTTTCAGGTCTTGATACGGTCAAATCTGTGTGGCATAACGACCTTGACG  
GTCAACGTATCGACCACTACCCAGCAAGCCTTGAACAATTGAAACGTTGTAAACCAATCTACGAAGAATTGCCAG  
GTTGGTCAGAAGACATCACAGGTTGCCGTAGCCTAGATGAACTTCCCGAAAATGCTCGTGACTACGTTCCGCCGTG  
TTGGTGAACCTCGTTGGTGTTCGCATTTCAACATTCTCAGTTGGCCCC

**27.        *Streptococcus canis* (SEQ ID NO. 27)        SCAN**

TGGCTTGCNATCGACCAAGGTAACCTATCCATTTGTTACTTCTTCAAACCCAGTTGCTGGTGGGGTAACAATCGG  
TTCAGGTGTTGGTCCAAGCAAGATCAATAAAGTTGTCGGTGTATGTAAAGCTTACACAAGCCGTGTTGGTGACGG  
TCCGTTCCCAACAGAACTTCTAGATGAAGTTGGAGATCGTATCCGTGAAATTGGTCACGAATATGGTACAACAAC  
TGGACGTCCACGTCGTGTTGGTTGGTTTGACTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGTATCACAAA  
CTTGTCACCTAACTCAATCGATGTTCTTTCAGGACTTGATACTGTTAAAATCTGTGTGGCATAACGACCTTGACGG  
TCAACGTATCGACCACTACCCAGCAAGTCTTGAACAATTGAAACGTTGTAAACCAATCTACGAAGAATTGCCAGG  
TTGGTCAGAAGACATCACAGGTTGCCGTAGCCTAGATGAACTTCCCGAAAATGCTCGTGACTACGTTCCGCCGTG  
TGGTGAACCTCGTTGGTGTTCGCATTTCAACATTCTCAGTTGGCCCC

**28.        *Streptococcus mutans* (SEQ ID NO. 28)        SMUT**

TATGGCTTGCNATTGACCAAGGTAACCTATCCATTTGTAACCTTCATCAAATCCAGTTGCAGGTGGCGTTACCATC  
GGATCTGGTGTGGACCAAGTAAATCAATAAGGTTGTTGGTGTCTGCAAAGCCTATACCAGCCGTGTAGGTGAT  
GGTCCTTTCCCAACAGAACTTTTTGACCAAACGGGAGAGCGCATTCGTGAAGTTGGGCATGAATACGGGACAACA  
ACAGGGCGTCCGCGTCGAGTTGGTTGGTTTGACTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGCATTACC



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AATTTATCTCTTAAGTGTATTGATGTACTTTTCAGGTCTTGATATCGTAAAAATCTGTGTAGCCTATGATTTGGAT  
GGAAAACGGATTGATCACTACCCTGCCAGTCTCGAACAACCTCAAACGCTGTAAACCTATTTATGAAGAATTGCCG  
GGCTGGTCTGAAGATATTACAGGGGTTTCGCAGTTTAGAAGATCTTCCTGAAAATGCTCGTAATTATGTCCGCCGT  
GTAAGTGAATTAGTTGGTGTTCGTATTTCTACTTTCTCAGTNGTCCCC

**29. *Streptococcus gordonii* (SEQ ID NO. 29)****SGOR**

TAATGCTAGCAATTGACCAAGGTACCTATCCATTTGTAACCTCATCTAATCCAGTTGCTGGTGGTGTAAACGATCG  
GTTCTGGTGTGGGTCCTAGCAAGATTGACAAAGTAGTGGGTGTTTGTAAGCCTATACAAGTCGTGTTGGTGATG  
GTCCTTTCCCAACAGAGCTTTTCGATGAAGTAGGTGACCGCATTTCGTGAGGTTGGTCATGAGTATGGTACAACAA  
CAGGACGTCCGCGTCGAGTTGGTTGGTTTGACTCTGTTGTTATGCGCCATAGCCGCCGTGTATCTGGGATTACCA  
ATCTTTTCGCTTAAGTCTATCGATGTTTTGAGCGGTCTGGATACAGTCAAGATCTGTGTAGCCTATGATTTGGATG  
GCCAAAGAATCGACCACTATCCAGCTAGTTTGGAAACAGCTTAAACGTTGTAAGCCGATTTACGAAGAGCTTCCTG  
GATGGTCTGAAGATATTACTGGCGTTTCGTAAGTTAGAAGATCTTCAGAAAATGCTCGCAACTATGTTTCGGCGAG  
TAAGCGAGTTGGTTGGTGTACGTATTTCCACCTTCTCAGTTGGCCCC

**30. *Bacillus species* (SEQ ID NO. 30)****BSPE**

TATGGCTTGCAATTGACNCGGTACGTACCCATTTCGTTACATCTTCTAACCCGATTGCGGGTGGTGTAAACAGTTGG  
AACTGGAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTTGGTGACGG  
TCCATTCCCTACTGAACTTAATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTACGGAACAACAAC  
TGGTCGTCCGCGCCGCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCGCGTCGTGTTAGTGGTTTTAACGGA  
TCTATCATTAAATTCTATCGACGTTTTAACAGATATTCGACTCTTAAAATTTGTGTTGCTTACAAATACAATGG  
CGAAGTTATCGATGAAGTTCCAGCAAACCTTAAACATTTTAGCAAATGTGAGCCTGTATATGAAGAGCTTCAGG  
TTGGACAGAAGATATTACTGGTGTAATCATTAGACGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGT  
TTCTGAGTTAACAGGAATTCAATTATCTATGTTCTCAGTNGTCCCC

**31. *Bacillus pumilus* (SEQ ID NO. 31)****BPUM**

GTTATGGCTTGCTATTGATCAAGGGACATATCCATTTGTCACGTCATCTAACCCAGTAGCTGGAGGAGTGACGAT  
TGGTTCTGGCGTAGGACCAACAAAAATTCAACATGTGGTCGGCGTGTCAAAGCGTACACAACACGTGTTGGAGA  
TGGCCCATTTCCGACAGAACTCCATGATGAAATTGGCGATCAAATCCGTGAGGTTGGCCGTGAATACGGTACAAC  
AACTGGACGTCCGCGCCGTGTTGGCTGGTTTGACAGTGTCTGTTGTCCGTCATGCTCGACGTGTGAGCGGGATTAC  
AGATCTATCTCTTAAGTCAATTGATGTACTGACAGGATTGAAACATTGAAAATCTGTGTGCTTATAAATTGAA  
CGGAGAAATCACAGAGGAATTCCCAGCAAGTCTAAATGAACTAGCGAAATGTGAGCCTGTCTACGAAGAAATGCC  
AGGATGGACAGAGGATATTACAGGCGTGAAGAATTTAAGCGAACTGCCTGAAAATGCCCGTCATTATTTAGAGCG  
CATTTACAATTAACAGGTATTCCACTTTCCATTTTCTCAGTTGNCCCC

**32. *Enterococcus villorum* (SEQ ID NO. 32)****EVIL**

TATCGACCAGGGACATATCCATTTGTTACTTCTTCCATCCAGTAGCAGGTGGTGTAACAATTGGTAGTGGCGTTG  
GTCCATCTAAATTAATAAAGTCGTTCGGAGTATGTAAAGCTTATACTTCTCGTGTGGAGATGGCCCGTTCCCTA  
CAGAATTATTTGATGAAACAGGGCAACAAATACGTGAAGTAGGTCGTGAATATGGCACAACAACAGGTCGTCCAC  
GACGAGTTGGATGGTTTGATACGGTTGTTATGCGCCATTCAAACGTTGATCAGGTATTACAAATTTATCTCTTA

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ATTCGATTGATGTATTAAGCGGATTAGAAACAGTAAAAATTTGTACGGCCTATGAACTAGATGGTGAGCTGATTT  
ATCATTACCCAGCAAGTTTGAAGAATTGAAACGTTGTAAACCAGTATATGAAGAACTACCTGGATGGTCTGAAG  
ATATTACGAAATGCAAGACACTTTCTGAATTGCCAGAAAATGCACGTAACCTATGTAAGACGTATTTCTGAGCTTG  
TAGGTGTACGCATCTCCACATTTCTCAGTGGNCCC

**33.       *Bacillus thuringiensis* serovar *israelensis*       BTHUISR**  
**(SEQ ID NO. 33)**

CNCGGTACGTACCCGTTTCGTTACATCTTCTAACCCGATTGCGGGTGGTGTAACAGTTGGAACCTGGAGTTGGCCCT  
GCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTTGGTGACGGTCCATTCCCTACTGAA  
CTTAATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTACGGAACAACAACCTGGTCGTCCGCGCCGC  
GTAGGTTGGTTCGATAGCGTTGTTGTAAGACATGCGCGTCGTGTTAGTGGTTTAAACGGATCTATCATTAATTTCT  
ATCGACGTTCTAACAGATATTCCAACCTCTTAAAATTTGTGTTGCTTACAAATACAATGGCGAAGTTATCGATGAA  
GTTCCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATT  
ACTGGTGTAATAATCATTAGACGAGCTTCTGAAAATGCAAGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGA  
ATTCAATTATCTATGTTCTCAGTGGCCCC

**34.       *Bacillus thuringiensis* serovar *kurstaki*       BTHUKUR**  
**(SEQ ID NO. 34)**

GGTCGTATCCATTCGTTACATCTTCTAACCCAGTTGCTGGTGGTGTAACAATCGGTTCTGGAGTTGGTCCTTCTA  
AAATCAATCGTGATAGTAGGCGTATGTAAAGCATATACAAGCCGTGTTGGTGACGGTCCATTCCCTACTGAACTTA  
ATGATGAAATTGGCCATCAAATTCGTGAAGTTGGTCGTGAATATGGTACAACAACAGGTCGTCCACGTCGCGTAG  
GTTGGTTTTGACAGCGTTGTTGTAAGACATGCACGCCGTGTGAGTGGTTTAAACAGATTTATCTTTAAACTCTATCG  
ACGTATTAACAGGTATTCCAACCTGTGAAAATCTGTATTGCATATAAGTATAATGGAGAAGTTCTGGATGAAGTTC  
CAGCAAACCTTAAACATTTTAGCAAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACTG  
GTGTAAAATCATTAGAGGAGCTTCTGAAAATGCAAGACATTATGTAGAGCGTGTGTCTCAATTAACAGGTATCC  
AATTATCTATGTTCTCAGTTGNCCCCC

**35.       *Bacillus mycoides* MYC003 (SEQ ID NO. 35)       BMYC003**

GGTNCGTACCCATTCGTTACATCTTCTAACCCGATTGCTGGTGGTGTAACAGTTGGAACCTGGAGTTGGTCCTGCG  
AAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTAGGTGATGGTCCGTTCCCTACTGAGCTT  
CATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAATACGGAACAACAACCTGGTCGTCCACGCCGCGTA  
GGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATCTATCATTAATTTCTATC  
GACGTTCTAACAGGTATTCCAACCTCTTAAAATTTGTGTTGCTTACAAATACAATGGCGAAGTTATCGATGAAGTT  
CCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACT  
GGTGTAAGAGCATTAGACGAGCTTCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAATT  
CAATTATCTATGTTCTCAGTGGNCCCCCG

**36.       *Bacillus mycoides* NRS306 (SEQ ID NO. 36)       BMYC306**

CGGTNCGTACCCGTTTCGTTACATCTTCTAACCCGATTGCTGGTGGTGTAACAGTTGGAACCTGGAGTTGGTCCTGC  
GAAAGTTACTCGCGTTGTAGGTGTGTGTAAAGCATATACAAGCCGTGTAGGTGATGGTCCATTCCCTACTGAGCT

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TCATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTATGGAACGACAACCTGGTCGTCCACGCCGCGT  
AGGTTGGTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACAGATTTATCATTAAATTCTAT  
CGACGTTCTAACAGGTATTCCAACCTCTTAAAATTTGTGTTGCTTACAAATACAATGGCGAAGTTATCGATGAAGT  
TCCAGCAAACCTTAAACATCTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGGAAGAAGATATTAC  
TGGTGTAATAATCATTAGACGAACTTCCTGAAAATGCAAGAAAATACGTAGAGCGTGTTTCTGAATTAACAGGAAT  
CCAATTATCTATGTTCTCAGT

**37.       *Bacillus weihenstephanensis* (SEQ ID NO. 37)       BWEI**

TTTTTTTNGGAAGNGCGCAAGGTGTTATGCTTGATATCGACCACGGTACGTACCCGTTTCGTTACATCTTCTAACC  
CAATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAG  
CATATACAAGCCGTGTTGGTGATGGTCCATTCCCTACTGAACTTAATGATGAAATCGGTCACCAAATTCGTGAAG  
TTGGTCGTGAATACGGAACAACAACGGGTCGTCCACGCCGTGTAGGTTGGTTCGATAGCGTTGTTGTAAGACATG  
CACGTCGTGTTAGTGGTTTAAACAGATTTATCATTAAACTCTATCGATGTATTAACAGGTATTCCAACGTTTAAAA  
TTTGTGTTGCTTACAAATGCAATGGCGAAGTTATCGATGAAGTTCCAGCTAACTTAAACATTTTAGCGAAATGTG  
AGCCTGTATATGAAGAGCTTCCNGGTTGGACAGAAGATGTTACTGCTGTGAAATCATTGGATGAGCTTCCTGAAA  
ATGCAAGAAAATACGTAGAGCGTGTTTTCTGAATTAACNGGAAGCCAATTNNCAAG

**38.       *Staphylococcus haemolyticus* (SEQ ID NO. 38)       SHAE**

CAAGGTGTCATGTTAGATATCGACCATGGTACATATCCTTTTCGTAACCTCAAGTAACCCGTGTTGCAGGTAATGTA  
ACAGTTGGTACAGGTGTAGGCCCAACTTTTCGTATCTAAAGTGATTGGTGTATGTAAAGCATATACATCTCGTGTA  
GGCGATGGTCCATTCCCTACAGAATTATTTGATGAAAATGGACATCATATTAGAGAAGTTGGTCGTGAATACGGT  
ACAACAACAGGACGTCCACGTCGTGTAGGTTGGTTTGAAGTCAAGTTGTATTACGTCACTCTCGTCGTGTTAGTGGT  
ATTACAGACTTATCTATTAAGTCTATCGACGTACTTACAGGTCTTGATACAGTGAAGATTTGTACTGCTTACGAA  
TTAGATGGAGAAGAAATTACAGAATATCCTGCTAACTTAGATCAATTACGTGCTTGTAAACCAATCTTTGAAGAG  
TTACCAGGATGGGAAGAAGATATCACTGGTTGCCGTACATTAGAAGAATTACCAGATAACGCACGTAAATACTTA  
GAACGCATTTCTGAATTATGTAATGTACGTATTTCAATCTTCTCAGT

**39.       *Staphylococcus saprophyticus* (SEQ ID NO. 39)       SSAP**

GCAAGGTGTGATGTTAGATATCGACCATGGTACATATCCATTTCGTTTCATCAAGTAACCCAGTTGCAGGTAATGTG  
ACTGTCGGTGGCGGTGTAGGTCCAACATTCGTCTCTAAAGTTATCGGTGTGTGTAAAGCCTATACATCACGTGTC  
GGCGATGGTCCATTCCCAACAGAAGTATTTGACGAAGATGGGCACCACATCCGTGAAGTAGGTCGTGAATACGGT  
ACAACAACAGGACGTCCACGTCGTGTAGGTTGGTTCGACTCAGTTGTATTACGTCACTCTCGTCGTGCAAGTGGT  
ATTACAGATTTATCTATTAAGTCAATTGATGTATTAACAGGCCTTAAAGAAGTTAAAATCTGTACTGCTTATGAG  
TTAGACGGTAAAGAAATTACGGAATACCCAGCTAACTTGAAAGACTTACAACGTTGTAAAGCCAATTTTGTAAACA  
TTACCAGGTTGGACAGAAGATGTGACAGGTTGTCGTTTATTAGAAGAATTACCTAATAATGCGCGTAGATACTTA  
GAACGTATTTCTGAATTATGTGACGTGAAGATTTCAATCTTCTCAGTTGGCCC

**40.       *Bacillus subtilis* (SEQ ID NO. 40)       BSUB**

CTCAAGGGGTTATGCTTGATATTGACCAAGGGACATACCCGTTTGTCACTTCATCCAACCCGGTCGCCGGAGGGG  
TGACGATCGGTTACAGCGTAGGCCCGACAAAATCCAGCACGTCGTGCGGTGTATCTAAAGCGTACACAACCCGTG

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TCGGTGACGGTCCTTTCCCGACTGAGCTGAAAGATGAAACCGGGGATCAAATCCGTGAAGTCGGACGCGAATACG  
GCACAACGACAGGCCGTCCGCGCCGTGTGGCTGGTTTGACAGCGTTGTTGTCCGCCATGCCCCGCCGCTCAGCG  
GAATCACAGATCTTTCTCTGAACTCAATCGATGTGCTGACTGGCATTGAAACATTGAAAATCTGTGTCGCTTACC  
GCTACAAAGGTGAAGTGATTGAAGAATTCCCGGCAAGTCTGAAAGCTCTCGCAGAGTGTGAACCGGTATATGAAG  
AAATGCCTGGCTGGACGGAAGATATCACAGGCGCAAAAACATTAAGCGATCTTCCTGAAAATGCGCGCCATTATC  
TGGAACGCGTGTCTCANCTGACAGGTATTCCGCTTTCTATTTTCTCAGTAGGTCCAGA

**41. *Listeria monocytogenes* (SEQ ID NO. 41) IMON**

TTTGGAAGGGGCGCAAGGGGTATGCTTGATATTGATCAAGGAACATATCCATTTGTAACCTCAAGTAACCCGAT  
TGCTGGTGGCGTAACATATCGGTAGTGGTGTGGTCCTTCAAAAATCAATCATGTTGTTGGTGTGGCGAAAGCTTA  
TACAACACGTGTTGGTGTGGTCCTTTCCCAACAGAATTATTTGATTCTATTGGTGACACTATTCGTGAAGTCGG  
TCATGAATATGGTACAACGACTGGTCGTCCGCGTCGTGTAGGTTGGTTTGATAGCGTAGTGGTTCGTCATGCGCG  
TCGTGTTAGTGGATTAACAGATTTATCGTTAACACTACTTGATGTTTTGACAGGAATTGAGACACTTAAAATCTG  
TGTAGCTTACAAATTAGACGGAAAAACAATTACAGAGTTCCAGCAAGTTTGAAAGATTTAGCTCGTTGCGAACC  
TGTTTATGAAGAACTTCCAGGCTGGACGGAAGATATTACTGGAGTTACATCACTAGATGATCTTCCAGTGAAC TG  
CCGCCATTACATGGAGCGTATCGCCCAACTTACGGGAGTGCAAGTTTCTATGTTCTCAGTAGGTCCCAGACCA

**42. *Lactococcus lactis* (SEQ ID NO. 42) LLAC**

TNATGCTTGATATTGACNAGGAACATACCCATTTGTAACCTTCTCAAACCCAGTAGCTGGTGGGGTAACGATTGGC  
TCTGGTGTGGGTCCATCAAAAATTTCAAAGTTGTTGGTGTGTTGTAAAGCCTATACTTCACGTGTGGGTGATGGT  
CCATTCCCAACAGAACTTTTTGATGAAGTTGGACATCAAATTCGTGAAGTAGGACATGAATATGGAACAACAACA  
GGACGTCCACGTGCTGTTGGTTGGTTTGACTCAGTCGTAATGCGTCATGCAAACGTGTTTCTGGCTTGACAAAT  
CTTAGCTTGAATTCAATTGACGTTCTCTCAGGACTTGAAACAGTAAAAATTTGTGTTGCTTACGAACGTAGTAAT  
GGTGAACAAATTACTCATTATCCAGCATCACTTAAGGAATTAGCAGATTGCAAACCAATCTATGAAGAAATGCCA  
GGATGGTCTGAAGATATTACTTCATGCCGAACCTTTAGAAGAGTTACCAGAAGCTGCTCGTAACATATGTTCTGTCG  
GTTGGTGAAC TAGTTGGCGTACGTATCTCGACTTTCTCAGTNGTCCCC

**43. *Enterococcus hirae* (SEQ ID NO. 43) EHIR**

CTTTTTGAAGGGGCGCAAGGGTAATGCTAGATATTGACCAAGGTACCTATCCATTTGTAACCTCATCTAATCCA  
GTTGCTGGTGGTGTAAACGATCGGTTCTGGTGTGGGTCTAGCAAGATTGACAAAGTAGTGGGTGTTTGTAAGCC  
TATACAAGTCGTGTTGGTGTGGTCCTTTCCCAACAGAGCTTTTCGATGAAGTAGGTGACCGCATTTCGTGAGGTT  
GGTCATGAGTATGGTACAACAACAGGACGTCCGCGTCGAGTTGGTTGGTTTGACTCTGTTGTTATGCGCCATAGC  
CGCCGTGTATCTGGGATTACCAATCTTTGCTTAACTCTATCGATGTGTTGAGCGGTCTGGATACAGTCAAGATC  
TGTGTAGCCTATGATTTGGATGGCCAAAGAATCGACCACTATCCAGCTAGTTTGGAACAGCTTAAACGTTGTAAG  
CCGATTTACGAAGAGCTTCCTGGATGGTCTGAAGATATTACTGGCGTTCTGAAGTTAGAAGATCTTCAGAAAAT  
GCTCGCAACTATGTTTCGGCGAGTAANCAGTTGGTTGGTGTACGTATTTCCACCTTCTCAGTAGGTCCAGACCA

**44. *Enterococcus avium* (SEQ ID NO. 44) EAVI**

CTTTTCGAAGGTGCGCAAGGTGTAATGCTGGATATTGATCAAGGGACTTATCCATTTGTTACCTCTTCTAATCCG  
GTTGCCGGCGGTGTACAGATCGGTAGCGGTGTTGGACCATCGAAGATTGATAAAGTCGTAGGGGTATGTAAAGCT

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TATACATCACGCGTTGGTGATGGACCTTTTCCAACGGAATTATTTGACGAAGTCGGCGATCAGATCCGCGAAGTT  
GGTCGTGAATATGGAACAACAACCTGGCCGTCCACGTCGAGTTGGCTGGTTTGAAGTCTGTGGTTATGCGGCACTCA  
AAACGCGCTTCTGGGATTACCAATCTATCTTTGAACTCAATCGATGTGTTGAGCGGCTTGGAACGGTCAAGATT  
TGTACCGCTTATGAGTTAGACGGAGAATTAATCTATCATTATCCAGCAAGCTTAAAGGAATTGAATCGCTGCAAA  
CCAGTTTATGAAGAGCTACCTGGCTGGAGTAAGGATATTACTGGCTGTCGTGATT

45. *Streptococcus bovis* (SEQ ID NO. 45) SBOV

TTTTTGAAGGGGCTCAAGGTGTCATGCTTGATATTGACCAAGGTACATACCCATTTGTTACATCTTCAAACCCAG  
TTGCTGGTGGTGTAACATATCGGTTCAAGTGTGGTCCAAGCAAGATCAACAAAGTTGTTGGTGTATGTAAAGCCT  
ACACAAGTCGTGTTGGTGATGGTCCATTCCCAACAGAACTTCTAGACGAAGTTGGAGATCGTATCCGTGAAATCG  
GTCACGAATATGGTACAACAACAGGACGTCCACGTCGTGTTGGATGGTTTGAAGTCAAGTTGTAATGCGTCACAGCC  
GTCGCGTATCAGGTATCACAACTTGTCACTTAACCTCAATCGACGTTCTTTGAGGACTTGATACTGTAAAGGTCT  
GTGTGGCTTACGACCTTGATGGCCAACGTATCGACCACATCCAGCAAGTCTTGAACAATTGAAACGTTGTAAAC  
CAATCTACGAAGAATTGCCAGGTTGGTCAGAAGACATCACAGGCTGCCGTAGCCTAGATGAGCTTCCAGAAAATG  
CTCGTAACTATGTTGTCGTGTTGGTGAAGTGTGGTGTTCGCATTTCAACATTCTCAGTTGGTCCAGGCCA

46. *Streptococcus thermophilus* (SEQ ID NO. 46) STHE

CTATTTGAAGGTGCGCAAGGAGTTATGCTTGATATTGACCAAGGAACATACCCATTTGTAACGTCATCAAACCCA  
GTTGCTGGTGGTGTTACAATTGGTTCTGGTGTGGGCCATCTAAAATTAATAAGGTTGTGGGTGTATGTAAGGCC  
TATACAAGTCGTGTCGGCGATGGTCCCTTTCCCAACTGAGTTGTTTGATGAAGTGGGTGAACGTATCCGTGAAGTT  
GGCCATGAATATGGAACAACAACCTGGACGTCCACGTCGTGTGGGATGGTTTGAAGTCAAGTTGTAATGCGTCATAGC  
CGTCGTGTATCAGGTATTACAAACCTTAGCTTGAAGTGTATCGACGTTCTTTCTGGTCTTGATACTGTGAAAAT  
TGTGTAGCCTACGATCTTGATGGTGAGCGCATTTGATTACTATCCGGCTAGCCTTGAGCAATTGAAACGTTGTAAA  
CCAATTTATGAAGAATTGCCAGGTTGGGAAGAGGATATTACAGGTTGCCGTAGTTTANATGAGCTTCCTGAAAAT  
GCCCCTAATTATGTTGTCGTGATTGGTGAGTTGGTCCGTATACNTATCTCTACCTTCTCAGTAGGCCNNACCA

47. *Streptococcus suis* (SEQ ID NO. 47) SSUI

CGAAGGACGCAAGGAGTTATGTTGGATATGACCAAGGTACCTATCCATTGCTTACTTCTTCAAACCCAGTTGCTG  
GTGGTGTGACGATCGGTAGCGGTGTGCGCCCAAGCAAGATTGACAAGGTTGTTGGTGTATGTAAGGCCTACACTA  
GCCGTGTTGGTGACGGACCATTTCCGACTGAATTGCACGATGAAATCGGAGACCGTATCCGCGAAATCGGTAAAG  
AGTACGGTACGACAACCTGGCCGTCCACGCCGTGTCGGTTGGTTTGAAGTCAAGTTGTAATGCGCCATAGCCGCCGTG  
TGTCAGGTATTACCAACTTGTCCCTCAACTCGATTGACGTCCTTGTGAGGTCCTGGGACCTTGAAAATCTGCGTGG  
CTTATGACTTGGATGGTGAGCGTATTGACCACTACCCAGCAAGTTTGGAGCAACTCAAACGTTGCAAACCAATCT  
ACGAAGAAATGCCAGGTTGGTCTGAAGACATCACAGGTGTACGTAGCCTGGATGAATTGCCAGAAGCGGCTCGCA  
ACTATGTTGTCGTATCAGCGAATTGGTAGGCGTTCGTATCTCAACCTTCTCAGTAGGTCCAGACC

48. *Bacillus pseudomycolides* (SEQ ID NO. 48) BPMS

CTATTTGAAGGGGCGCAAGGCGTAATGCTTGATATTGATCAAGGTACGTATCCATTGCTTACATCTTCTAACCCA  
GTTGCTGGTGGTGTAACAATCGGTTCTGGAGTTGGTCCTTCTAAAATCAATCGTGTAGTAGGCGTATGTAAAGCA  
TATACAAGCCGTGTTGGTGACGGTCCATTCCCTACTGAACTTAATGATGAAATTGGCCATCAAATTCGTGAAGTT

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GGTCGTGAATATGGTACAACAACAGGTCGTCCACGTCGCGTAGGTTGGTTTGACAGCGTTGTTGTAAGACATGCA  
CGCCGTGTGAGTGGTTTAAACAGATTTATCTTTAACTCTATCGACGTATTAACAGGTATTCCAACGTGTAAGAAATC  
TGATTGCATATAAGTATAATGGAGAAGTTCTGGATGAAGTTCCAGCAAACCTTAAACATTTTAGCAAAATGTGAG  
CCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACTGGTGTAAAATCATTAGAGGAGCTTCCTGAAAAT  
GCAAGACATTATGTAGAGCGTGTGTCTCAATTAACAGGTATCCAATTATCTATGTTCTCAGTAGGGCCNGACCA

**49.       *Staphylococcus capitis capitis* (SEQ ID NO. 49) SCAPCAP**

CTCTTCGAGGAGCTCAAGGTGTCATGTTAGACATCGACCATGGTACTTACCCATTTCGTTACGTCAAGTAACCCAG  
TTGCTGGTAATGTCACAGTAGGTACAGGTGTAGGTCCTACATCAGTTTCTAAAGTCATCGGTGTATGTAAATCAT  
ATACGTACAGTGTAGGTGATGGTCCATTCCCCACAGAATTATTCGATGAAGATGGTCATCACATTAGAGAAGTAG  
GTCGTGAATATGGTACAACAACAGGACGTCCACGCCGTGTAGGTTGGTTTGACTCAGTGGTACTACGTCATTTCAC  
GTCGCGTAAGTGGTATCACAGATCTTTCAATCAACTCTATCGACGTTTTAACAGGTTTAGATACAGTTAAAATTT  
GTACAGCATATGAGTTAGATGGCGAAGAAATCACTGAATACCCAGCTAACTTAGATCAATTAAGACGCTGTAAAC  
CAATCTTCGAAGAACTTCCAGGTTGGACAGAAGATATCACAGGGCTGCCGCAGTTTAGAAGAACTCCCTGAAAAT  
GCNCNCCAAATACCTAGAGCGTATTTCAAATTATGTGGCGTACNCATTTCAATCCTTCTCAGTAGGGGCCCTGA  
CCCC

**50.       *Staphylococcus sciuri* (SEQ ID NO. 50)                               SSCI**

CTTTTTGAAGGTGCGCAAGGTGTTATGTTAGATATCGACCACGGTACATATCCATTTCGTTACTTCAAGTAATCCA  
ATTGCAGGTAACGTTACAGTAGGTGGCGGTGTTGGTCCAACATACGTATCTAAAGTAATTGGTGTATGTAAAGCT  
TATACATCTCGTGTAGGAGACGGTCCATTCCCAACAGAATTATTTGATGAAGATGGTCACCATATCCGTGAAGTA  
GGTCGTGAATACGGTACAACAACCTGGAAGACCACGTCGTGTAGGTTGGTTTGACTCAGTAGTTCCTACGTCACTCA  
CGCCGTGTAAGTGGTATTACAGATTTATCAATCAACTCAATTGACGTATTAACAGGATTAAAAACAGTTAAATC  
TGTAACAGCATACGAAATTGATGGTGTGAAATCACTGAATATCCAGCAAACCTTAAACGAATTAGAACGTTGTAAA  
CCAATCTTTGAAGAACTACCAGGTTGGGAAGAAGACATTACAGGATGCCGTTCACTAGAAGAATTACCAGATAAC  
GCACGTCGTTTTTTTAAACGCATCTCTGAATTATGTANCGTTAAANTTCTATCTTCTCAGTAGGTCCAGGTC

**51.       *Staphylococcus warneri* (SEQ ID NO. 51)                               SWAR**

CTTTTTGAAGGAGCGCAAGGTGTGATGTTAGACATCGACCACGGTACATATCCATTTCGTCACTTCAAGTAACCCA  
GTAGCAGGTAACGTTACTGTAGGTACTGGTGTAGGTCCAACATACGTATCAAAGTCATTGGTGTATGTAAAGCT  
TATACATCACGTGTTGGTGTAGGTCCATTCCCTACAGAATTATTTGATGAAGATGGTCATCACATTAGAGAAGTT  
GGTCGTGAATACGGTACAACAACCTGGTCGTCCACGTCGTGTAGGTTGGTTCGACTCAGTAGTATTACGTCATTCA  
CGCCGTGTAAGTGGTATTACAGACTTATCAATCAACTCAATTGATGTGTAACTGGCTTAGATACAGTTAAAATC  
TGTAACAGCATATGAATTAGATGGTAAAGAAATTAAGTGAATATCCAGCTAACCTAGATCAATTACAACGTTGTAAA  
CCAATCTTCGAAGAATTACCTGGTTGGACAGAAGATATTACAGGTTGCCGTACTTTAGAAGAGCTTCCTGAAAAT  
GCACGCAAATATTTAGAAGCTATTTCTGAATTATGTGGCGTACGTATTTCAATCTTCTCAGTTGGTCCCTGGCCAG  
GGCGA

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**52.       *Staphylococcus lugdunensis* (SEQ ID NO. 52)       SLUG**

TTCTTTGAAGGAGCTCAAGGTGTTATGTTAGATATTGATCATGGTACATATCCTTTTCGTCACATCAAGCAATCCT  
GTAGCCGGCAATGTCACTGTTGGTACAGGTGTAGGTCCAACCTTCGTTTCTAAAGTAATTGGTGTGTGTAAAGCA  
TACACATCTCGCGTAGGCGATGGTCCTTTCCCAACTGAACTATTTGATGAAGATGGGCACCATATTAGAGAGGTT  
GGTCGTGAATATGGTACGACGACAGGACGTCCACGTGCGGTGGGTTGGTTTGATTTCAGTCGTGCTACGTCACTCA  
CGTCGTGTTAGTGGTATTACAGACTTATCTATTAACCTCTATTGATGTACTAACAGGTTTAGATACGGTAAAAATT  
TGTACAGCTTATGAGTTAGATGGAGAAGAAATTACGGAGTATCCAGCTAACCTTGATCAATTAAACGTTGTAA  
CCAATCTTTGAAGAATTACCTGGTTGGACAGAAGATATTACAGGCTGTCGTTTCATTAGAAGCATTGCCTGATAAT  
GCACGTCGCTATTTAGAACGTATTTCAGAATTATGCGGCGTTCATATTTCAATTTTCTCAGTAGGGCCAGACCA

**53.       *Staphylococcus gallinarum* (SEQ ID NO. 53) SGAL**

CTTTTTGAAGGTGCGCAAGGCGTTATGTTAGATATCGACCATGGTACATACCCATTTGTTACTTCTAGTAATCCA  
GTTGCAGGTAACGTAACCTGTAGGTGGCGGTGTTGGACCAACATTCGTATCAAAGTAATTGGCGTATGTAAAGCC  
TATACATCACGTGTTGGTGACGGCCCATTTCCCAACTGAATTATTTGATGAAGATGGACATCATATCCGTGAAGTT  
GGCCGCGAATATGGTACAACAACAGGACGTCCACGTGCTGTGGGTTGGTTTGACTCTGTTGTATTACGTCATTCA  
CGCCGTGCAAGTGGTATCACAGATTTATCTATCAACTCTATTGACGTATTAACAGGTCTTGAAAATGTTAAGATT  
TGTACTGCATACGAATTAGATGGAGAAGAAATCACTGAATACCCAGCAAACCTTAAAGGACTTACAACGTTGTAA  
CCAATCTTTGAAACATTACCAGGTTGGACAGAAGATGTCACAAGCTGTCGTTCACTAGATGAATTACCAGATAAT  
GCACGCAGATATTTAGAGCGCATTTCTGAACCATGTAACGTGAAGATTTCAATCTTCTCAGTAGGGCCAGACCA

**54.       *Staphylococcus schleiferi schleiferi* (SEQ ID NO. 54) SSCH**

GACCTGGACCAACTGAGAAGATAGAAATATGGACGTTACATAATTCTGAAATACGCTCTAAGTAACGGCGTGCAT  
TTTGTGGTAGTTCGTCTAAACTACGTACACCTGTAATATCTTCAGTCCAACCTGGTAATGTTTCAAAGATAGGTT  
TACAACGTTTTAAGTCGTTTAAAGTTTGCTGGGTATTCCGTAATCTCTTTCCATCTAATTCATAAGCTGTACAGA  
TTTTAACCTCTTCTAAGCCAGTTAAGACGTCGATAGAGTTGATTGATAAATCTGTAATCCCACTTACACGACGAG  
AGTGACGTAATACAACGGAGTCAAACCAACCTACACGGCGTGGACGACCTGTTGTTGTGCCATATTCACGTCCGA  
TTTACGAATATGGTGCCCTTGTTTCATCAAATAATTCTGTTGGGAATGGCCCATCACCTACACGTGAAGTGTATG  
CTTTACATACGCCAACTACTTTTGATACATTTGTTGGCCCTACACCAGCACCAACTGTCACGTTACCCGCTACAG  
GGTACTTGATGTTACAAAAGGATATGTTCCGTGATCGATGTCTGACATCACCCCTTGAGCCCTTCAAAGAGA

**55.       *Staphylococcus capitis ureolyticus* (SEQ ID NO. 55)       SCAPURE**

GACCAGGCCCAACTGAGAAGATTGAAATGTGTACGCCACATAATTCTGAAATACGCTCTAGGTATTTGCGTGCAT  
TTTCAGGGAGTTCTTCTAGACTGCGACAACCTGTGATATCTTCTGTCCAACCTGGAAGTTCTTCGAAGATTGGTT  
TACAGCGTCTTAATTGATCTAAGTTAGCTGGGTATTCAGTGATTTCTTCGCCATCTAACTCATATGCTGTACAAA  
TTTTAACTGTATCTAAACCTGTTAAACGTCGATAGAGTTGATTGAAAGATCTGTGATACCACTTACGCGACGTG  
AATGACGTAATACTACTGAGTCGAACCAACCTACACGGCGTGGACGTCCTGTTGTTGTACCATATTCACGACCTA  
CTTCTCTAATGTGATGACCATCTTCATCGAATAATTCTGTAGGGAATGGACCATCACCTACACGTGACGTATATG  
ATTTACATACACCGATGACTTTAGAACTGATGTAGGACCTACACCTGTACCTACTGTGACATTACCAGCAACTG  
GGTACTTGACGTAACGAATGGATATGTACCGTGGTCGATGTCTAACATGACACCTTGCGCACCTTCAAATAAA

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**56.        *Staphylococcus cohnii urealyticum* (SEQ ID NO. 56)****SCAPURE**

CTCGTTGAAGGTGCACAAGGCGTTATGTTAGATATCGACCACGGTACATACCCATTCGTTACGTCAAGTAACCCA  
GTTGCAGGTAATGTCACTGTCCGGTGGTGGTGGTGGTCCAACATACGTATCTAAAGTCATTGGCGTATGTAAAGCT  
TATACATCACGTGTCCGGTATGGCCCATTCCTAACAGAACTATTTGATGATGATGGACACCACATCCGTGAAATT  
GGCCGTGAGTACGGTACAACACTACTGGACGTCCACGTTCGTGTAGGTTGGTTCGATTTCAGTTGTATTACGTCACTCT  
CGTCGTGCGAGTGGTATTACTGATTTATCAATCAACTCTATCGATGTCTTAACAGGCCTTAAAGAAGTGAAGATT  
TGTACGGCGTATGAATTGGACGGTAAAGAAATTACTGAATATCCAGCGAATTTAAAAGACTTACAACGTTGTAAG  
CCAATCTTTGAAACATTACCTGGTTGGACAGAAGATGTTACAGGTTGTCGCTCATTAGATGAGCTGCCAGACAAT  
GCACGTAGATATTTAGAACGTATCTCTGAATTATGTGACGTTCAAATTTCAATCTTCTCAGTAGGGCCTGACCA

**57.        *Staphylococcus xylosus* (SEQ ID NO. 57)****SXYL**

CTTTTTGAAGGTGCTCAAGGTGTAATGCTAGATATCGATCATGGTACTTACCCATTCGTTACTTCAAGTAACCCA  
GTTGCCGGTAACGTTACTGTTGGTGGCGGTGTAGGTCCAACATTCGTATCTAAAGTCATTGGTGTATGTAAGGCA  
TATACATCACGTGTAGGCGATGGTCCTTTCCCAACTGAACTATTTGATGATGACGGGCACCATATCCGTGAAGTA  
GGTCGTGAATACGGTACAACACTACAGGTCGTCCACGCCGTGTAGGTTGGTTCGATTTCAGTTGTATTACGTCACTCT  
CGCCGTGCGAGTGGTATTACAGACCTATCAATCAACTCTATTGATGTGTTAACAGGTCTAAAAGAAGTTAAAATC  
TGTAATGTCCTATGAGTTAGACGGTAAAGAAATCACTGAATATCCAGCAAACCTGAAAGACTTACAACGTTGTAAG  
CCAATCTTTGAAACATTGCCTGGTTGGACAGAAGATGTAAGTGGTTGTCAATCATTAGATGAATTACCTGATAAT  
GCACGTAGATACTTAGAACGTATATCTGAACTAAGTGATGTTAAGATTTCTATCTTCTCAGTAGGGCCAGATCA

**58.        *Staphylococcus simulans* (SEQ ID NO. 58)****SSIM**

CTATTTGAAGGAGCGCAAGGGGTTATGTTAGACATCGACCATGGTACATACCCATTCGTTACATCAAGTAACCCG  
ATTGCTGGTAACGTTACTGTCCGGCGCGGTATCGGACCAACATCAGTATCTAAAGTAATCGGTGTATGTAAAGCG  
TATACGTCACGTGTAGGTGATGGTCCATTCCCTACTGAATTATTCGATGAAGATGGTCATCATATCCGTGAAGTA  
GGTCGTGAATATGGTACAACACTACAGGACGCCCACGTTCGTGTCGGCTGGTTCGACTCAGTGGTATTACGTCATTCA  
CGTCGTGTAAGTGGTATTACTGACTTATCTATCAACTCAATCGACGTTTTAACTGGTTTTAGATACAGTTAAAATC  
TGTGTTGCGTATGAGTTAGATGGTGAAGAAATCACTGAATACCCAGCAAACCTTAAACGCGTTGAACCGTTGTAAA  
CCAATTTACGAAGAATTACCAGGTTGGTCTGAAGATATTACAGGCGTACAATCATTAGAAGAATTACCAGATAAC  
GCACGTCGTTACTTAGAACGTATTTCTGAGTTATGTAACGTAGGTATCTCAATCTTCTCAGTTGGTCCAGGTCA

**59.        *Staphylococcus cohnii cohnii* (SEQ ID NO. 59)        SCOHCOH**

TATTTGAAGGTGCACAAGGAGTAATGCTTGATATCGATCATGGTACTTATCCGTTTCGTCCTTCAAGTAACCCGA  
TTGCCGGTAACGTAACAGTTGGTACTGGTGTAGGTCCAACGTTTGTAGATAAAGTTGTTGGTGTATGTAAAGCTT  
ACACATCACGTGTAGGGGATGGACCATTCCCAACTGAATTATTTGATGAAGATGGTCATCATATTCGTGAAGTGG  
GTCGTGAATATGGAACGACTACAGGACGTCCACGTCGTGTAGGTTGGTTTGAATCTGTTGTATTACGCCATTCTC  
GCCGTGCAAGTGGTATTACGGACTTGTCAATTAACCTCTATTGACGTATTAACCTGGTTTAGAACTGTTAAGATTT  
GTACAGCATATGAATTGGATGGAAAAGAGATTACAGAATATCCAGCGAATTTAAATGAACTAAATCGTTGTAAAC  
CGATTTTCGAAGAATTACCAGGATGGACTGAAGATGTGACTTCATGTAAGTCATTAGACGAGCTACCTGATAACG  
CACGCCGTTACTTAGAGCGTATTTCCGAGTTATGTAATGTTAAGATTTCTATCTTCTCAGTAGGTCCAGACCA



**60.        *Staphylococcus auricularis* (SEQ ID NO. 60)        SAURICU**

CTATTTGAAGGAGCTCAAGGTGTGATGTTAGATATCGACCATGGTACGTACCCATTTGTTACATCTAGTAACCCCT  
GTTGCTGGTAACGTGACAGTGGGTGCAGGTGTAGGTCCAACGTTTGTCTCTAAAGTGATTGGTGTATGTAAAGCC  
TATACATCACGTGTCGGTGATGGTCCATTCCCAACTGAATTATTTGATGATGATGGTCACCACATCCGTGAAGTC  
GGACATGAATACGGTACAACAACAGGACGCCCCAAGACGTGTCGGTTGGTTCGACTCTGTGGTATTACGTCACTCT  
CGCCGTGTGAGCGGTATTACAGACCTTTCTATTA ACTCTATTGATGTGTTAACTGGTTTTANATACAGTTAAAATT  
TGTACCGCATACGAATTAGATGGGGAAGAAATTACAGAGTACCCAGCAAACCTTAAACGATCTAAAACGCTGCAAA  
CCAATCTTTGAAGAACTTCCAGGTTGGAACGAANATATTACAGGTTGCCGCAGCTTAGAAGAATTACCTGACAAT  
GCACGTCACTACTTANAACGCATTGCANAACCTTTGTGACGTAAACATTTCAATCTTCTCAGTTGGGCCAGACCA

**61.        *Staphylococcus caseolyticus* (SEQ ID NO. 61)        SCAS**

CTTTTTCGAAGGGGCGCAAGGAGTAATGCTTGATATCGATCATGGTACTTATCCGTTTCGTCACCTTCAAGTAACCCG  
ATTGCCGGTAACGTAACAGTTGGTACTGGTGTAGGTCCAACGTTTGTAGATAAAGTTGTTGGTGTATGTAAAGCT  
TACACATCACGTGTAGGAGATGGACCATTCCCAACTGAATTATTTGATGAAGATGGTCATCATATTTCGTGAAGTG  
GGTCGTGAATATGGAACGACTACAGGACGTCCACGTGCTGTAGGTTGGTTTGACTCTGTTGTATTACGCCATTCT  
CGCCGTGCAAGTGGTATTACGGACTTGTCAATTA ACTCTATTGACGTATTA ACTGGTTTAGAACTGTTAAGATT  
TGTACAGCATATGAATTGGATGGAAAAGAGATTACAGAATATCTAGCGAATTTAAATGAACTAAATCGTTGTAAA  
CCGATTTTTCGAAGAATTACCAGGATGGACTGAAGATGTGACTTCATGTAAGTCATTAGACGAGCTACCTGATAAC  
GCACGCCGTTACTTAGAGCGTATTTCCGGAGTTATGTAATGTTAAGATTTCTATCTTCTCAGTTGGTCCAGACCA

**62.        *Listeria innocua* (SEQ ID NO. 62)        LINN**

CTTTTTCGAAGGAGCACAAAGGGGTTATGCTTGATATTGATCAAGGAACATATCCATTTGTAACCTTCAAGTAATCCG  
ATTGCTGGTGGCGTAACAATTGGTAGCGGTGTTGGCCCATCGAAAATCAATCATGTTGTTGGTGTGCAAAAGCA  
TATACAACCTCGTGTTGGAGATGGTCCTTTCCCAACTGAATTATTTGATTCTATTGGTGACACTATCCGTGAAGTT  
GGCCATGAATATGGTACAAC TACTGGTCGTCCGCGTCGTGTAGGTTGGTTTGATAGCGTGGTTGTTTCGTCATGCT  
CGTCGTGTGAGCGGACTAACAGGTTTATCCTTAACGCTACTGGACGTTTTGACAGGGATTGAAACACTTAAAATC  
TGTGTAGCGTACAAGTTAGACGGAAAAACAATTACAGAATTTCCCGCAAGCTTGAAAGACTTAGCTCGTTGTGAA  
CCTGTTTATGAAGAACTGCCTGGTTGGACAGAAGATTTACTGAAGTGCAATCATTAGATGACCTACCAGTAAGT  
TGTCGTCATTACATGGAACGCATTGCTCAACTTACAGGTGTGCAAGTTTCTATGTTCTCAGTAGGGCCTGATCA

**63.        *Escherichia coli* K12 (SEQ ID NO. 63)        ECOK12**

CTATTTGAAGGGGCGCAAGGAAAAAGGATTGTCGATGCATAACGCCTCCGGATTGACTCTGGCTTAAAGCGTAGT  
CAGTGGAGGAGATAACAAATTCATTTTTACAAAACTTAAACATGAAGGGGGAGACGCTTCTCCCCCTTAGTTT  
TCAGGCCTTCTCAAGCATGGCGTGCTTCTGCAGGCTCTGGATACTCAGCGTTAAGCTCATCAGACAATTTTCAAG  
CTTATCGGCGTTGACGGTAATAACAGTCGGGCAATCATGGTGCCCACTCATCAAACATACTGCGGCTGTGCTAA  
TGCTTCTTCAGCATGATGAAGAGCACTCCACTCTTCTGATCCAGATGAAGATTCAACCGCAGCGATTTATCGTG  
CAGTTCGCGATT CAGTTTAAAAAAGTTATCTCGTAGATGATTGCTTTCGCTGACGGACATGTATCCTTTTGCCTT  
TCTCAGTTGGGCCAGACCA

**Figure 5. Molecular marker II (ptsI) sequences amplified from Gram positive bacteria (SEQ ID NOs: 64-107; SEQ ID NOs: 109-111, SEQ ID NOs: 117-129, SEQ ID NO: 137, SEQ ID NOs 145-148), from some Gram-negative bacteria (SEQ ID NOs 108, 112-116, 130-136, 138-144) and from the fungi *Cryptococcus neoformans* (SEQ ID NO: 149).**

**64. *Bacillus anthracis* 1978 (SEQ ID NO. 64)**

ANTTNGGGCATGGGNCCNTCTTTATNAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATAT  
GGTTGGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCG  
ATAGAGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCA  
ACTTCAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCT  
TGACGGAACATCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAAT  
GCACGAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCANGAACGGATNT  
TTTTCTTTAA

**65. *Bacillus anthracis* butare (SEQ ID NO. 65)**

NCTTGGCAGGGCCNTCTTNATNAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATATGGTT  
GGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGATAG  
AGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTT  
CAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCTTGAC  
GGAACATCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCAC  
GAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCAAGAACGGAT

**66. *Bacillus anthracis* Sterne (SEQ ID NO. 66)**

ACTGCGCATNNGCCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATATGGT  
TGGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGATA  
GAGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACT  
TCAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCTTGA  
CGGAACATCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCA  
CGAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCANGAACGGATNNTTT  
NTCTTAA

**67. *Bacillus anthracis* 1655H85 (SEQ ID NO. 67)**

NNCNNGCATGGGCCNTCTTTATNAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATATGGT  
TGGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGATA  
GAGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACT  
TCAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCTTGA  
CGGAACATCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCA  
CGAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCANGAACGGANCTTTT  
TTCTTTA

**68. *Bacillus anthracis* Coda-Cerva (SEQ ID NO. 68)**

ANNTGGCATNGGNCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATATGGT  
TGGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGATA  
GAGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACT  
TCAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCTTGA  
CGGAACATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCA  
CGAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCANGAACGGATCNTTT  
NTCTT

**69. *Bacillus anthracis* 2054H82 (SEQ ID NO. 69)**

TTNNGGCATGGCGCCNTCTTNATNAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATAGGTTATATG  
GTTGGTATAAGTAAGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGA  
TAGAGAAGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAA  
CTTCAATAGAATCAGAAACAGTTGTACCCACTTCTACAAGTTTCGCTTTTTCTTCTAATAAGATCGCTTTTGCTT  
GACGGAACATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATG  
CACGAAGTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTAGCCCAAGAACGGATCTT  
TTTCTTTA

**70. *Bacillus cereus* ATCC 10987 (SEQ ID NO. 70)**

GCCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTA  
TGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTGTTCGATAGAGAAGAAGTC  
AACTTCTTTTCGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATC  
AGAAACAGTTGTACCCGCTTCTACAAGTTTCGCTTTCTCTTCTAATAAAATCGCTTTTCGCTTGACGGAACATC  
AAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGT  
ACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCATTCTCGTTA

**71. *Bacillus cereus* ATCC 14579 (SEQ ID NO. 71)**

CCATTTCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTAT  
AAGTATGATACTTGTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTGTTCGATAGAGAAG  
AAGTCAACTTCTTTCGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATA  
GAATCAGAAACAGTTGTACCCGCTTCTACAAGTTTCGCTTTCTCTTCTAATAAAATTGCTTTTCGCTTGACGGAAC  
TCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGT  
TGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGATATCCCAAGAACGGA

**72. *Listeria monocytogenes* (SEQ ID NO. 72)**

GCCCTCTTTATGAGAAGCATCAATTACCATTTTTACTAAACGTAAGATGGATGGATTGTATGGTTGGTAAAGGTA  
AGAAACGCGTTCGTTTCATACGGTCCGCAGCCATTGTATACTGAATTAAGTCATTTGTTCCGATAGAGAAGAAATC  
AACTTCTTTTGCAAATTGATCAGCAAGAACTGCAGCGGCAGGAATTTCAATCATAATTCCAAGTTTCGATGGAATC  
AGATACTTCTGTTCCAGCAGCTTTTAGTTTTGCTTTCTCATCTAGTAAATATCACGTGCTTGACGGAATTCATT

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TACTGTTGCAATCATCGGGAACATAATTTTTAAGTTACCATATACACTTGCGCGAAGTAAGGCGCGAAGTTGCGT  
ACGGAATAATTCTTCATTTCGCAAAACAAAGACGAATTGCGCGGAATCCCAAGAACGGATCNTTCTCCTTA

73. *Streptococcus pneumoniae* (SEQ ID NO. 73)

CGCGTGAGCTGCTTTGATCCATTGTTAATCAAGCGTAGGATTGATGGGTTGTATGGTTGGTAAAGGTATGAAACT  
TGTTTCGTTTCATACGGTCTGCTGCCATTGTATATTGGATCAAGTCATTTGTACCAATTGAGAAGAAGTCAACTTCT  
TTAGCAAATTGGTCTGCAAGCATAGCCGCTGCAGGAATCTCGATCATGATACCAACTTGAATGTTATCCGCAACT  
GCAACACCTTCAGCAAGAAGGTTTGCTTTTTCTTCATCAAAGACTGCTTTCGCTGCACGGAATTCTTTCAAGAGC  
GCAACCATTGGGAACATGATACGCAATTGACCGTGAACAGACGCACGAAGAAGAGCACGGATTTGTGTGCGGAAC  
ATAGCATCTCCAGTCTCAGAGATAGAGATACGAAGAGCACGGAATCCNANGAACGGATCCTTTTTTCNTA

74. *Streptococcus pyogenes* (SEQ ID NO. 74)

TGCGCTGCTTTGATACATTGTTGATCAAACGTAATATTGATGGGTTGTATGGTTGGTAAAGGTATGATACTTGTT  
CGTTCATACGGTCTGCTGCCATAGTGTATTGGATAAGGTCGTTTGTTCCAATTGAGAAGAAATCAACTTCCTTAG  
CAAATTGGTCTGCAAGCATAGCAGCTGCAGGAATCTCAATCATGATACCAACTTGGATGTCATCAGCAACCGCAA  
CGCCTTCTGCAAGCAAGTTTGCTTTTTCTTCGTCAAAGACTGCTTTTGCAGCACGGAATTCTTTAAGAAGCGCAA  
CCATTGGGAACATAATACGAAGTTGTCCGTGAACAGAGGCACGAAGAAGCGCACGCATTTGTGTGCGGAACATGG  
CATCCCCAGTTTCAGAGATGGAAATACGAAGAGCACGGAACCNAAGAACGGATCNTTTTTNCCNTA

75. *Streptococcus agalactiae* (SEQ ID NO. 75)

GAGCAGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGATTGTATGGTTGATAGAGGTATGAAACTTGCT  
CATTCATACGGTCCGCAGCCATTGTGTATTGGATAAGATCATTAGTACCAATTGAGAAGAAATCAACTTCCTTTG  
CAAATTGGTCTGCAAGCATAGCTGCCGCTGGGATTTCAATCATAATACCAACTTCAATGCCTTCAGCTACTGCTA  
CACCGTCAGCTAACAAAGTTCGCTTTCTCTTCTTCAAATATAGCTTTAGCAGCACGGAATTCTTTAAGCAAAGCAA  
CCATTGGGAACATGATGCGTAGCTGTCCATGAAGTGAAGCACGAAGAAGTGCTCGGATTTGTGTGCGGAACATTG  
CATCACCAGTTTCAGAAATTGAAATACGCAATGCACGGAATCCCAAGAACGGATCNTTTTTTCNTA

76. *Streptococcus mutans* (SEQ ID NO. 76)

TGAGCAGCCTTAACCCATGATCAACCAAGCGAAGAATGGATGGATTATAAGGTTGGTAGAGGTATGATACTTGTT  
CATTCATACGGTCAGCAGCCATGGTGTATTGAATAAGGTCATTTGTACCGATTGAGAAGAAATCAACTTCCTTAG  
CAAATTGGTCAGCCAACATTGCAGCTGCAGGAATTTCAATCATGATACCAACTTGGATATCATCTGAAACAGCAA  
CGCCTTCAGCTTTAAGATTAGCCTTTTCTTCTTCCAGAATACCTTTAGCTTTACGGAACTCATTGAGCAAAGCTA  
CCATTGGGAACATGATACGCAACTGACCATGAACAGAAGCACGCAAAAGGGCACGCAACTGTGTGCGGAACATCT  
GATTGCCTGTTTCTGAGATTGAAATACGAAGTGCACGAAAACCAAGAACGGATCATTCTCTTA

77. *Enterococcus faecalis* (SEQ ID NO. 77)

CGTCGTGTGCTGCATCAATTACATTTTTTAATTAAACGTAAGATTGATGGGTTGTATGGTTGGTATAAGTAAGAAA  
CGCGTTTCGTTTCATACGGTCTGCCGCCATTGTGTATTGGATTAAGTCGTTGGTTCCAACACTAAAGAAGTCTACTT  
CTTTGGCAAATTTATCAGCTAATACGGCAGCTGCTGGAATTTCAATCATAATACCTACTTGGATATCGTTTGAAA  
CTTCAACACCTTCGTTGACTAATTTTTGTTTTCTTCAAAGATTGCTTTCGCTGCTCTAAATTCTTTCAAAG

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TAGCAACCATTGGGAACATGATACGTAAGTTACCATGAACAGACGCACGTAATAATGCACGCATTTGTGTACGGA  
ACATGCCGTCACCTAGTTCTGATAAGCTAATACGTAATGCACGGTAACCCAAGAACGGATNATTCTCGTA

**78.           *Staphylococcus aureus* (SEQ ID NO. 78)           SAUR**

NNCCNTCTTATGTGACGCTTCAATAACTTGTTTAACTAAACGTAAGATTGAAGGGTTATATGGTTGGTATAGAT  
ATGATACACGCTCTGACATACGGTCAGCAGCTAATGTGTATTGAATTAAATCATTTGTACCGATACTGAAGAAAT  
CTACTTCTTTAGCAAAGACATCAGCTAATGCTGCTGTTGCAGGTATCTCTACCATGATTCTAATTCTATATCAT  
CCGAAATGTCATGACCTTCATTTTTTAAGGTTTTCTTTTTCTTCTAATAATATAGCTTTTGCTTCTCTAAATTCGT  
TAATTGTTGCAACCATTGGGAACATGATATTTAACTTACCATAAACTGATGCACGTAATAATGCACGTAGCTGTG  
GTCTGAAAATATCTTGTGCGCAAGGCATAAACGAATCGCACGGTAACCCAAGAACGGATCCNTTNTCCTTAA

**79.           *Staphylococcus epidermidis* (SEQ ID NO. 79)           SEPI**

CTTCTTTATGAGAAGCTTCAATAACTTGTTTAACTAATCGTAAAATTGAAGGATTATATGGTTGATATAAGTATG  
AAACTCGTTTCAGACATACGGTCAGCAGCTAATGTGTATTGAATTAAGTCATTTCGTTTCTATACTAAAGAAATCTA  
CTTCTTTAGCAAATACATCAGCAAGTGCCGCGGTAGCTGGAATTTCAACCATAATACCTAATTCAATATCATCTG  
AAACTTCGTAACCTTCGCGAAGAAGATTTTCTTCTCTTCAAGAAGCATTGATTTAGCGTCACGGAATTCCTTAA  
TTGTTGCTACCATTTGGGAACATAATATTCAATTTCCCATAGACTGAAGCACGTAGTAATGCACGTAATTGTGGTC  
TAAAGATTTCCGGCTGTGCTAAACATAAACGTATCGCACGATAACCCAAGAACGGATCNTTCTNCGTA

**80.           *Bacillus thuringiensis* serovar *israelensis*           BTHUISR  
(SEQ ID NO. 80)**

CTTTATGAGCAGCATCGATAACCATTTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTATGATA  
CTTGTTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTCGTTCCGATAGAGAAGAAATCAACTT  
CTTTCGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATCAGAAA  
CAGTTGTACCCGCTTCTACAAGTTTCGCTTTCTCTTCTAATAAAATCGCTTTCGCTTGACGGAACCTCATCAAGAG  
TTGCAATCATTGGGAACATAATTTTAAAGTTGCCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGA  
ACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCATTCTCNTTA

**81.           *Bacillus thuringiensis* serovar *kurstaki*           BTHUKUR  
(SEQ ID NO. 81)**

GCCATTTTCCTTCTTTATGAGCAGCATCGATAACCATTTTTTACAAGGCGTAAAATAGATGGATTATACGGTTGGT  
ATAAGTAAGATACACGTTTCATTCATACGGTCTGCAGCCATTGTGTATTGGATTAGGTCGTTTGTTCGATAGAGA  
AGAAATCAACTTCTTTTGCAAACCTGATCTGCTAATACTGCAGAAGCGGGAATTTCTACCATCATACCTACCTCAA  
TAGCATCAGAAACAGTTGTACCAGCTTGAACAAGTCTTTCTTTCTTCTAATAAAATTGCTTTTGCTTGACGGA  
ATTCATCAAGAGTTGCAATCATTGGGAACATAATTTTAAATTACCATATACGCTTGACGAAGCAATGCACGAA  
GTTGTGTACGGAACACATCTTGTCTTCAAGGCATAAGCGAATCGCACGGTAACCCAAGAACGGA

**82.           *Staphylococcus hominis* (SEQ ID NO. 82)           SHOM**

CNCCNNCCTTATGAGGAAGCTTCAATAACCTGTTTAACTAAACGTAAAAATTGCTGGATTATATGGTTGATATAAA  
TATGAAACACGTTTCAGACATACGATCAGCTGCCATAGTATATTGAATTAAGTCATTAGTTTCTATACTAAAGAAA

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TCTACTTCTTTAGCAAAGATATCAGCTAACGCAGCAGTAGAAGGAATCTCTACCATGATACCTACTTCGATATCA  
TCAGCAACTTCTTGTCTTCGCTAGTTAATTTATCTTTTTCTTCTAAAAGAATAGCTTTAGCATCTCTAAACTCT  
TTAATAGTAGCTACCATTTGGGAACATAATATTTAATTTACCATAAGCAGATGCGCGTAATAACGCACGTAATTGT  
GTTCTGAAGATGTCTTGTGATCTAAGCACAAACGAATTGCACGATAACCCANGAACGGATTCATNTCNTA

**83. *Enterococcus faecium* (SEQ ID NO. 83)****EFCM**

CGCGTGTGCTGCATCAATTACATTTTTGATCAAACGTAATAATTGATGGGTATATGGTTGGTACAAGTAAGAAAC  
GCGTTCGTTTCATACGGTCTGCTGCCATTGTGTATTGAATCAAATCGTTCGTACCTACAGAGAAGAAATCTACTTC  
TTTTGCAAACCTTGTCTGCTAAGACTGCTGCTGCTGGAATCTCGATCATGATGCCGACTTGGATCGTATCAGATAC  
TTCCTTGCCTTCACTGATCAATTTTTGTTTTCTTCTTCAAAGATCGTTTTGCTGCGCGGAATTCTTTGAGTGT  
AGCTACCATAGGGAACATGATACGTAAGTTACCATGAACAGATGCACGAAGCAATGCACGCATTTGTGTACGGAA  
CATTTTCGTCGCCTTGTTTCAGATAAACTGATACGCAATGCACGATATCCCAAGAACGGATCATTCTCCTTA

**84. *Clostridium perfringens* (SEQ ID NO. 84) CPER**

CNTGTTTGTGAGCTCCATCTATTGTCAATTTTGATTAATCTTAATACAGCTGGATGCATTGGATTGTAAAGGTATG  
ATACCTTTTCACTCATTCTGTGAGCAGCTAATGTATATTGTATTAAATCGTTAGTTCCTATTGAGAAGAAATCAA  
CATGCTTAGCTAATTCATCAGCATAAACTGCTGCAGCTGGGATTTCAACCATGATACCCATTGAATTGAATCTG  
AGTATGCTATACCTTCTGCTTTTAACTCAGCTTTGCATTCTTCAACAAATGCTTTAGCTTGTGGAATTCTTCTA  
ATCCTGAAATCATTGGGAACATTACTGCAAGATTTCCATAAACAGAAGCTCTTAATAAAGCTCTTATTTGAACTC  
TAAAGATATCTTTTCTGTCTAAGCATAATCTTATAGCTCTGTATCCCAAGAACGGATCNNTNNTCNTTAA

**85. *Bacillus mycoides* MYC003 (SEQ ID NO. 85) BMYC003**

CTTTATGAGCAGCATCGATCACCATTTTTACAAGACGTAAAATTGATGGGTATATGGTTGGTATAAGTAAGATA  
CACGTTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAGTCATTTGTTCCGATAGAGAAGAAATCGACTT  
CTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGAATTTCAACCATCATACCAACTTCAATAGAATCAGAAA  
CAGTTGTACCCGCTTGGACAAGTCTTTCTTTCTTCTAATAAAATCGCTTTGCTTGACGGAATTCATCAAGAG  
TTGCAATCATCGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGA  
ACACATCTTGTTCTTCAAGGCATAAGCGAATTGCACGGTATCCCAAGAACGGATCNTTCTCNTTA

**86. *Bacillus mycoides* NRS306 (SEQ ID NO. 86) BMYC306**

GCCATTTTCCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTATATGGTTGGT  
ATAAGTAAGCTACTTGTTCGTTTCATACGGTCCGAGCCATTGTGTATTGGATTAAATCATTGTTCGATAGAGA  
AGAAATCAACTTCTTTTGCGAATTGATCTGCTAATACTGCAGAAGCTGGAATTTCAACCATCATACCAACTTCAA  
TAGAATCAGAAACAGTTGTACCCGCTTCTACAAGTTTTGCTTTCTTCTAATAAGATTGCTTTGCTTGACGGA  
ACTCATCAAGAGTTGCAATCATTGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAA  
GTTGTGTACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCATTCTCTT

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87. *Streptococcus oralis* (SEQ ID NO. 87)

SORA

CNNTTTCCTTCGCGTGAGCTGCTTTGATAACGTTGTTGATCAGCGTAGGATTGATGGGTTGTATGGTTGGTAAA  
GGTATGAAACTTGCTCGTTCATACGGTCTGCTGCCATTGTGTATTGGATCAAGTCGTTTGTACCAATTGAGAAGA  
AGTCAACTTCTTTAGCAAATTGGTCTGCAAGCATTGCTGCTGCAGGAATTTTCGATCATGATACCAACTTGGATAT  
TATCCGCAACTGCAACACCTTCAGCAAGAAGGTTTGCTTTTTCTTCGTCAAAGACTGCTTTCGCTGCACGGAATT  
CTTTCAAGAGCGCAACCATTTGGGAACATGATACGTAATTGACCGTGAACAGACGCACGAAGAAGAGCACGGATTT  
GTGTGCGGAACATAGCATCTCCAGTCTCAGAGATAGAGATACGAAGAGCACGGAATCCNAAGAACGGATCNTTTC  
TCTTA

88. *Enterococcus hirae* (SEQ ID NO. 88)

EHIR

CNATTTACCTTCGCATGCGCTGCATCGATCACGTTTTTAATCAAACGTAGGATTGATGGGTTGTAAGGTTGATAC  
AAGTATGAAACACGTTTCGTTTCATACGGTCAGCTGCCATAGTGTATTGGATCAAGTCATTTCGTTCTACTGAGAAG  
AAGTCAACTTCCTTAGCAAACCTTGTCAGCTAAGACAGCTGCTGCTGGAATTTTCGATCATGATGCCGACTTGGATC  
GTATCAGATACTTCCACGCCTTCATTCAATAATTTTGTGTTTTCTTCGTTCAAAGATTGCTTTTGCAGCACGGAAT  
TCTTTAAGAGTCGCTACCATTGGGAACATGATACGTAAGTTCCATGAACAGATGCACGTAATAATGCGCGCATT  
TGCGTACGGAACATTTTCGTCACCTTGTTCTGACAAGCTGATTGCTAATGCACGATAGCCCAAGAACGGATCNTTN  
TCCTTA

89. *Enterococcus avium* (SEQ ID NO. 89)

EAVI

CNATTTNCCTTCGCGTGCGCTGCATCAATCACGTTTTTGATTAAGCGTAGAATTGATGGGTTATATGGTTGGTAA  
AGGTAAGAAACGCGTTTCGTTTCATACGGTCAGCTGCCATCGTGTATTGAATTAAGTCATTTGTTCCGATACTGAAG  
AAATCAACTTCCTTTGGCAAACCTTGTCAGCTAGTACAGCTGCAGCTGGAATTTTCGATCATGATTCGACTTGGATC  
GTATCAGAAACTTCCACGCCTTCTTTAACCAATTTTCTTTTTCTTCGTTGAACATTTTCTTCGCTGCACGGAAT  
TCTTTTAATGTCGCAACCATTTGGGAACATGATGCGTAAGTTACCATGAACAGAAGCGCGCAACAATGCACGTAAT  
TGTGTACGGAACATGTCATCGCCTAGTTCGGATAGACTAATACGCAATGCACGATAACCCAAGAACGGATCNTTT  
TTCTTAA

90. *Staphylococcus saprophyticus* (SEQ ID NO. 90)

SSAP

TCGTAAGAAGCTTCTATTACTTGTTTTACTAAACGTAATATTGAAGGATTATATGGTTGATACAAGTAAGAAACA  
CGTTCCTGACATTCTATCAGCAGCCATTGTATATTGAATTAATCATTCGTTCTTATACTGAAGAAATCAACTTCT  
TTAGCAAATACATCTGCCAACGCAGCAGTAGAAGGAATTTCTACCATAATACCAAGTTCGATATCATCAGAACT  
TCAATGCCTTCATTTGTTAAGTTATCTTTTTCTTCAAGTAACAATGCTTTAGCATCACGGAACCTTGGATTGTA  
GCTACCATAGGGAACATGATATTCAATTTACCAAAAGCAGATGCACGTAATAATGCACGCAACTGTGGTCTGAAA  
ATATCAGGTTGATCTAGGCATAAACGGATAGCACGGTAACCCAAGAACGGATCATTCTCTTA

91. *Staphylococcus haemolyticus* (SEQ ID NO. 91)

SHAE

GAAGCTTCATGACTTGTTTAACCAAGCGTAAAATAGCTGGGTTATAAGGTTGGTATAAGTATGAAACGCGTTCTG  
ACATACGGTCAGCTGCCATAGTATATTGAATTAATCATTAGTACCAATACTGAAGAAATCCATTTCTTTAGCAA  
AGATATCAGCTAAAGCAGCTGTAGATGGAATCTCAACCATGATACCTAACTCAATTTTCATCAGAAACGTCATGAC  
CATCATTTTTAAGATTTTCTTTTTCTTCTAACAGAATGGCTTTAGCATCACGGAATTCATTGATTGTAGCTACCA

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TTGGGAACATAATGTTTAAATTTACCGTAAGCTGACGCGCGTAATAATGCACGTAATTGTGTTCTGAAAATATCTT  
GTTGATCTAAGCATAGACGAATTGCTCTGTAACCCAAGAACGGNTCNTTCTCTTA

92. *Enterococcus flavescens* (SEQ ID NO. 92) EFLA

NGCATGCGCTGAGTCGATCACGTTTTTGATCAAACGTAAAATTGATGGGTTGTATGGTTGGTACAAGTAAGACAC  
GCGCTCGTTCATGCGGTCTGCAGCCATTGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCAACTTC  
CTTCGCAAACCTGTCTGCTAAGACAGCAGCTGCTGGAATTTTCGATCATGATTCCGACTTGGATCTCGTTAGAAAC  
CTCAACGCCTTCGTCAATCAATTTTTGACGCTCTTCTTCATACATTTTCTTCGCAGTACGGAACCTCTTTCAATGT  
TGCCACCATTGGGAACATGATACGTAAGTTGCCGTGAGCAGAAGCACGTAACAACGCACGAAGTTGGGTACGGAA  
CATGTCATCCCCAAGTTCAGATAAGCTGATACGCAATGCACGATAGCCCAAGAACGGATATTNNTCNTA

93. *Enterococcus casseliflavus* (SEQ ID NO. 93) ECAS

GCGCTGAGTCGATACGTTTTTGATCAAACGTAAAATTGATGGGTTGTATGGTTGGTACAAGTAAGACACGCGCTC  
GTTTCATGCGGTCTGCAGCCATGGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCAACTTCCTTCGC  
AAACTTGTCTGCTAAGACAGCAGCTGCTGGAATTTTCGATCATGATTCCGACTTGGATCTCGTTAGAAACCTCAAC  
GCCTTCGTCAATCAATTTTTGACGCTCTTCTTCATACATTTTCTTCGCAGTACGGAACCTCTTTCAATGTTGCCAC  
CATTGGGAACATGATACGTAAGTTGCCGTGAGCAGAAGCACGTAACAACGCACGAAGTTGGGTACGGAAACATGTC  
ATCCCCAAGTTCAGATAAGCTGATACGCAATGCACGATAGCCCAAGAACGGATNATTTNTCTTA

94. *Enterococcus gallinarum* (SEQ ID NO. 94) EGAL

ACCTTNGCATGTGCTGAATCGATTACGTTTTTGATCAACGTAGAAATAGATGGGTTATATGGTTGGTAAAGATATG  
AAACTTGTTTCATTTCATACGGTCTGCAGCCATTGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCTA  
CTTCCTTGGCAAATTTGTCAGCTAAGACAGCTGCTGCAGGAATTTTCGATCATGATACCTACTTGAATATCTTCAG  
AGACGGTTACGCCTTCATCGATCAATTTTTGACGTTCTTCTTCGTACATTTTTTTTCGCAGCACGGAACCTCTTCA  
ATGTTGCCACCATTGGGAACATAATCCGCAAGTTTCCGTGAGCAGAAGCACGTAACAGCGCACGAAGTTGTGTAC  
GGAACATGCCGTCACCCAACCTCAGACAACTGATACGCAATGCACGATAGCCCAAGAACGGATCTTTNTCCNTTA

95. *Enterococcus raffinosus* (SEQ ID NO. 95) ERAF

NTGTGCTGCATCAATGACGTTTTTAATCAAACGTAAAGATTGATGGGTTATATGGTTGATACAGGTATGAAACGCG  
TTCGTTTCATACGGTCAGCAGCCATTGTGTATTGAATCAAGTCGTTTGTTCCGATACTAAAGAAGTCAACTTCTTT  
TGCAAACCTTGTCAGCTAGAACAGCTGCGGCAGGGATCTCGATCATGATTCCGACTTGAATCGTATCAGAAACCTT  
CACGCCTTCGTTAACAAGCTTTTCTTTTTCTTCGTTGAACATTTTCTTCGCTGCACGGAACCTCTTTTAATGTTGC  
AACCATTGGGAACATGATGCGTAAATTGCCATGAAGTGAAGCGCGTAACAATGCACGTAAGTGTGTACGGAAACAT  
ATCGTCGCCTAATTCAGATAAACTGATACGCAATGCACGATAACCCAAGAACGGATNNTTCTNCGTAA

96. *Enterococcus villorum* (SEQ ID NO. 96) EVIL

GGNCTCTCGTCGTNAGCTGCATCAATCACGTTTTTGATTAAACGTAAAATTGATGGGTTATAAGGTTGGTATAAG  
TATGAAACGCGTTCGTTTCATACGGTCAGCTGCCATAGTGTATTGAATCAAATCATTTGTTTCTTACTGAGAAGAAG  
TCAACTTCCTTCGCAAACCTGTCAGCTAAAACAGCAGCTGCAGGAATTTCAATCATAATGCCGACTTGGATCGTA  
TCAGATACTTCCACGCCTTCATTCAATAACTTTTGTTCATCTCAAAGATTGCTTTTGCCCCACGGAATTCT



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TTAAGTGTGCCACCATTGGGAACATGATACGTAAGTTACCGTGAACGGATGCACGCAATAACGCACGCATTTGT  
GTACGGAACATTTTCGTCTCCTTGTTTCAGAAAGACTGATACGTAATGCACGATATCCNANGAACGGNTTATTTTTC  
NTA

97. *Clostridium difficile* (SEQ ID NO. 97) CDIF

TTTNNGGANGGCNTCTNTCGTANGCATTGTCTATANCAGTCTTTATAAGTCTTAAAACAGCTGGATNAAATTGAT  
TGTAAGNTAACTTATCTTTTGATTCACTTCTATCAACTGCACAAGTGTATTGAATTAAATCATTAGTTCCTATAG  
AGAAGAAATCTACGTGTTTAGCCAATACATCAGATATCACAGCAGCAGATGGAACCTTCTATCATCATACCAATTT  
CTACATCTTTAGCATAAGCCACACCTTCAGAATCAAGTTCTGCTAAAACCTTCTTTTACAACCTTCTTTAGCTTGTA  
ACAACCTCTTCTAAAGATGAAATCATTTGGGAACATGATTCTTAATCTTCCATGAACACTAGCTCTATATAAGCTC  
TCAATTGAGTCTTAAATATATCTTTTCTATCTAGGCAAAGTCTTATTGCTCTGTAACCCAAGAACGG

98. *Streptococcus mitis* (SEQ ID NO. 98) SMIT

NGCGTGAGCTGCCTTGATAACGTTGTTGATCAAGCGAAGGATTGATGGGTTATATGGTTGGTAAAGGTATGAAAC  
TTGCTCGTTCATACGGTCTGCTGCCATTGAGTATTGGATCAAGTCGTTTGTTCGAATTGACATGAAGTCTACTTC  
TTTTGCAAATTGGTCTGCAAGCATCGCTGCTGCAGGGATTTCATCATGATACCAACTTGGATATCATCCGCAAC  
TGCAACACCTTCAGCAAGAAGGTTTGCTTTTCTTCTTCATAAACTGCTTTGGCTGCACGGAATTCTTTCAAAG  
AGCAACCATTGGGAACATGATACGCAATTGACCATGAACAGAAGCACGAAGAAGAGCACGGATTTGTGTACGGAA  
CATTGCATCTCCAGTTTCAGAAATAGAGATACGAAGGGCACGGAATCCNAAGAACGGATATTTTTCNTA

99. *Bacillus halodurans* (SEQ ID NO. 99) BHAL

NCCTTCGCTATGAGCTGCTTTAATAACCATATCGACGAGGCGTAAAATCGCAGGGTGGTATGGCTGATACAGGTA  
GGAGACTCGCTCATTCATGCGGTCAGCAGCCATCGTATATTGAATTAAGTCGTTTCGTTCCGATACTGAAAAAGTC  
TACTTCTTTTGCAAAAAGATTAGCCGCTACCGCCGTCGATGGGATTTCTACCATGATTCCCACTTCAATTGAATC  
GGATACGTCCACTCCTTCACTAAGAAGCTTGTCTTTTCTCTTGCATGATCGCTTTTGCTTGGCGAAGCTCTTC  
AAGGGTGGCGATCATTGGAAACATCACCTTTAAGTTACCGTATGTGCTTGCGCGAAGCAAGGCACGGAGTTGGGT  
CCGGAAAATATCTTGTTTTTCAAGGCACAGACGAATCGCCCGAAACCNAAGAACGGATNNTTNTTCNTAA

100. *Bacillus weihenstephanensis* (SEQ ID NO. 100) BWEI

NTGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTAAGCTACTTG  
TTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAGTCATTTGTTCCAATAGAGAAGAAATCAACTTCTTT  
TGCGAACTGATCAGCTAATACTGCTGAAGCTGGAATTTCAACCATCATACCAACTTCAATAGAATCAGAAACAGT  
TGTACCCGCTTTAACAAGTCTTTCTTTCTTCTAATAAGATTGCTTTGCTTGACGGAACCTCATCAAGAGTTGC  
AATCATTGGGAACATAATTTTAAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGAACAC  
ATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCNTTCTCNTTA

101. *Streptococcus species* (SEQ ID NO. 101) SSPE

CNNANTTNCCTTCGCGTGAGCTGCTTTGATAACGTTGTTAATCAACGAAGGATTGATGGGTTGTATGGTTGGTAA  
AGGTATGAACTTGTTTCGTTTCATACGGTCAGCAGCCATTGTGTATTGGATAAGGTGCTTTGTTCGGATTGAGAAG  
AAGTCAACTTCTTTGCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTGGATA

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TCATCTGAAACGGCAACACCTTCAGCTTTAAGGTTTGCTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAAT  
TCTTTAAGAAGAGCAACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATT  
TGTGTACGGAACATTGCATTTCTGTTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGATCCTTT  
TTCCTTAA

102. *Streptococcus gordonii* (SEQ ID NO. 102) SGOR

NTGCCTTCGCATGAGCCGCTTGATAACATTGTTGATCAAGCGAAGGATAGATGGGTTATAAGGTTGATAGAGGT  
AAGAGACTTGTTTCATTCATCCGGTCAGCTGCCATAGTGTACTGGATCAAGTCGTTGGTACCAATTGAGAAGAAGT  
CAACTTCCTTGGCAAATTGATCCGCCAACATAGCTGCTGCTGGAATTTCAATCATGATACCCACTTGAATGTTAT  
CCGCTACAGCAACACCTTCAGCTTGCAATTTTCGCTTTTCTTCTTCGTAACTGCTTTAGCCTTACGGAATTCTG  
TTAGAAGGGCTACCATTGGGAACATGATACGTAATTGTCCATGTACAGACGCACGTAAGAGAGCGCGGATTTGTG  
TACGGAACATAGCATTACCAGTTTCAGAGATAGAGATACGCAAAGCACGGAAGCCNAAGAACGGTCNTTTT

103. *Streptococcus canis* (SEQ ID NO. 103) SCAN

CNCGTGAGCTGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGGTTGTATGGTTGGTAAAGGTATGAAAC  
TTGTTTCGTTTCATACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTTGTTCGATTGAGAAGAAGTCAACTTC  
TTTCGCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTCGATATCATCTGAAAC  
GGCAACACCTTCAGCTTTAAGGTTTGCTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAATTCTTTAAGAAG  
AGCAACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATTTGTGTACGGAA  
CATTGCATTTCTGTTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGTCNTTTTCTCTAA

104. *Bacillus pumilus* (SEQ ID NO. 104) BPUM

CNTACGCTGCTTCATAACAAGCGTAATCAAACGTAAATCGCTGGATTGTAAGGCTGGTAAAGATAAGACACTCG  
TTCGTTTCATTTCGATCAGCAGCCATTGTGTATTGAATCAAATCATTTGTTCCAATACTGAAGAAATCAACTTCTTT  
TGCGAATTGGTCTGCGATGACAGCGGTTGATGGAATTTCTACCATTATACCGATTTCAATGGAATCGGATACGTC  
TGTACCAGCGGCAACCAATGCTTCTTTTTCTTCAAGTAAATGGCTTTTGCTTCTCTAAATTCTGATAATGTGCG  
GATCATAGGGAACATGATTTTCAAGTTTCCATATGTACTTGCACGAAGTAAGGCGCGTAGTTGTGTTCTGAAAAT  
CTCCTGTTCTTCGAGGCAAAGGCGGATCGCTCTAAAGCCNAAGAACGGATNTTTTCTNTTAA

105. *Bacillus species* (SEQ ID NO. 105) BSPE

TGAGCGCATCGATAACCATTTTTACAAGACGTAAATAGATGGGTTATATGGTTGGTATAAGTATGATACTTGTT  
CGTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTTGTTCCGATAGAGAAGAAGTCAACTTCTTTCG  
CGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATCAGAAACAGTTG  
TACCCGCTTCTACAAGTTTCGCTTCTCTTCTAATAAAATTGCTTTTGCTTGACGGAACCTCATCAAGAGTTGCAA  
TCATTGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGAACACAT  
CTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCCNTTNTNCTTTAA

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**106.        *Lactococcus lactis*        (SEQ ID NO. 106)        LLAC**

GTGAGCTGCTTTGATNCATTGTTAATCAAACGAAGGATTGATGGATTGTAAGGTTGGTAAAGGTAAGAACTTGT  
TCATTCATACGGTCTGCAGCCATTGTATATTGGATGAGGTCGTTTGTACCAATTGAGAAGAAATCAACTTCCTTA  
GCAAATTGGTCTGCAAGCATTGCTGCTGCTGGAATTTCAATCATGATACCTACTTCGATACCATCTGCAACTGGA  
ACACCTTCAGCAATCAATTTTGCTTTTTCTTCGTCATAAATCTTCTTAGCTGCACGGAACCTCAGTTACGAGAGCA  
ACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGAAGCACGCAAGAGTGCACGCAATTGTGTACGGAACATT  
CCGTCACCAGCTGTTGAAAGGCTGATACGAAGTGCACGCCATCCCANGAACGGTNNTTTTTNTTTTAA

**107.        *Bacillus firmus* (SEQ ID NO. 107)        BFIR**

TCCAGGANGGGTTCNTCNTANGCTGCGTCAATTACCATTTTAACTAAACGCAGGATTGCAGGATTATACGGCTG  
GTAAAGGTAAGAAACACGCTCATTTCATGCGGTCTGCAGCCATTGTGTACTGAATTAGATCATTAGTGCCAACACT  
GAAGAAATCGACTTCTTTAGCAAACCTGATCAGCCATAACAGCAGTTGAAGGAATTTCAACCATAATTCGAATTC  
AATGTTGTGCGCAACCTCTGCTCCTTCGCTCACAAGCTTTTGTCTTTCTTCTTCAAGGATTGCTTTGCCCTGACG  
GAATTCTTCAAGAGTGGCAATCATAGGGAACATGATTTTAAAGGTTCCATAGGTGCTTGCTCTTAATAAAGCCCT  
TAATTGCGTCCTGAACATATCCTGTTCTTCCAGACACAGACGAATCGCCCGGAAGCCCAAGAACGGATTCAATNT  
CTTA

**108.        *Haemophilus influenzae* (SEQ ID NO. 108)        HINF**

TGAGAGGCATCAATCACTTGTTTAATTAAACCAAGCACAGAGGGGTGCATCGGATTATAAAGATGGGAAATAAAC  
TCATTACCGCGATCTACAGCCAAAGTATATTGAGTTAAATCGTTAGTACCGATACTAAAGAAATCCACTTCTTTT  
GCTAAAAATTTTGCAATTTACTGCGGCAGAGGGGGTTTCGACCATTACACCAACTTGGATATTATTATCAAACAGT  
CTCCCCCTCTTCACGTAATTCGCTTTTAAATGTTTCAATAACCGCTTTTAAATTCGGAATTTCTTCTACAGAAATA  
ATCATCGGGAACATTACCGCCAATTTACCAAAAGCTGAAGCACGTAACACCGCGCGTAATTGTGCATTTAAAATT  
TCACGACGATCTAATGCAATGCGAATCGCACGCCATCCCAAGAACGGATNNTTTTTTCTT

**109.        *Streptococcus bovis*        (SEQ ID NO. 109)        SBOV**

TGAGCTGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGGTTATATGGTTGGTAAAGGTATGAACTTGT  
TCATTCATACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTTGTTCGATTGAGAAGAAGTCAACTTCTTTT  
GCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTGGATATCATCTGAAACGGCA  
ACACCTTCAGCTTTAAGGTTAGCTTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAATTCTTTAAGAAGTGCA  
ACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATTTGTGTACGGAACATT  
GCATTTCTGTCTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGTCNNTTTTTNCTTA

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**110.      *Enterococcus durans*      (SEQ ID NO. 110)      EDUR**

TGTGCTGCATCAATCACGTTTTTGTATCAAACGTAAAATTGAAGGGTTATAAGGTTGATACAAGTAAGATACACGT  
TCGTTTCATGCGGTCAGCTGCCATTGTGTATTGAATCAAGTCATTTCGTACCTACTGAGAAGAAGTCAACTTCCTTC  
GCAAACCTTATCTGCTAAGACAGCTGCTGCAGGGATTTCAATCATGATGCCGACTTGGATCGTATCAGATACTTCC  
ACGCCTTCGCTCACTAATTTTTGTTTTCTTCTTCAAAGATTGCTTTCGCTGCACGGAATTCTTTAAGAGTCGCT  
ACCATTGGGAACATGATGCGTAAGTTTCCATGAACAGATGCACGTAACAATGCGCGCATTTGTGTACGGAACATT  
TCGTACCTAATTCAGACAAGCTGATACGTAGCGCACGATAGCCCAAGAACGGATNNTTTTTCCCTTAA

**111.      *Streptococcus sanguis* (SEQ ID NO. 111)      SSAN**

CGCATGAGCTGCCTTGATAACATTGTTAATCAAGCGAAGGATAGATGGATTGTAAGGTTGATAGAGGTAAGAGAC  
TTGCTCATTTCATCCGGTCAGCCGCCATAGTGTACTGAATCAAGTCGTTAGTACCAATTGAGAAGAAGTCTACTTC  
CTTGGCAAATTGATCCGCCAACATAGCTGCTGCTGGGATTTCAATCATGATACCCACTTGGATATTATCTGCTAC  
TGCAACGCCTTCAGCTTGCAGCTTAGCTTTTTCTTCGTCATAAACCGCTTTAGCTTTGCGGAATTCTGTTCAGAAG  
GGCCACCATTGGGAACATGATACGCAATTGTCCATGTACAGAAGCACGCAAGAGAGCGCGGATTTGTGTACGGAA  
CATAGCATCGCCAGTTTCAGAGATAGAGATACGCAAAGCACGGAAACCAAAGAACGGTNNTTTTTNTCTTTAAAA

**112.      *Enterobacter cloaceae* (SEQ ID NO. 112)      ECLO**

TCCTTTACCTTCTGCATGAGAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGTGACATTGGCTGGTAG  
AGATGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTGGTGCCGATACTAAAG  
AAATCAACTTCTTTGGCTAAATGACGCGCAATGGTCGCGGCTGCTGGTGTTCACCATTTACGCCGATCTCAATT  
GACTCGTCAAATGCTTTACCTTCGTCACGCAATTCCTGTTTGTAGATCTCGATCTCTTTCTTCAGTGCACGCACT  
TCTTCAACAGAGATGATCATCGGGAACATAATGCGCAGCTTACCGAAAGCAGAGGCACGCAGAATCGCACGCACC  
TGGTCACGCAGGATTTCTTTACGATCCATGGCGATACGCACTGCACGCCAGCCCAAGAACGGATNNTTTTTTCTT  
TAA

**113.      *Serratia liquefaciens* (SEQ ID NO. 113)      SLIQ**

NTGNCTTCTGCATGAGNATGCATCAATAACCTGTTTGATCAGGCCAAGCACTGATGGGGACATCGGGTTATAGAG  
ATGAGAAATCAGCTCATTGCCGCGATCTACCGCCAGAGTATACTGGGTTAGATCGTTTGTCCCAATACTAAAGAA  
GTGCACTTCTTTGCGCCAGGTGATGAGCAATCACTGCCGCGGCCGGTGTTCACCATTTACGCCCACTTCAATGGT  
CTCGTCAAAGGCCCTTGGATTCTTCACGCAGCTGCGCCTTCAGCGTCTCGATTTACCTTTTCAGATCGCGGACTTC  
TTCCACGGAAATGATCATCGGGAACATGATGCGCAGTTTGCCGAACGCGGAAGCGCGCAGGATGGCGCGCAGTTG  
CGCGTGCAGGATTTCTCTGCGGTCCATGGCGATACGAATCGCGCGCCAGCCNAAGAACGNNTNTTTTTTANTTTA

**114.      *Proteus mirabilis* (SEQ ID NO. 114)      PMIR**

GTGTGATGCATCAATCACCTGTTTAAATCAGATTAAGTACAGCAGGTGACATTGGATTATATAGATGAGATATCAG  
CTCATTTCCACGGTCTACAGCCAGAGTATATTGTGTTAGATCGTTAGTCCCAATACTGAAAAAGTCAACTTCTTT  
TGCCATATGGCGAGCCATAACAGCCGCTGCTGGCGTTTCAACCATAACACCGACTTCGATAGATTCATCAAAAGG  
CTTATTTTCTTCACGAAGCTGGCTTTTTCAGTATTTCAAGTTCCGCTTTCAATGCTCGGATCTCTTCAACAGAGAT  
AATCATTGGAAACATAATACGTAGTTTACCAAAGCAGACGCTCTTAAGATAGCACGTAATTGTGGATGAAGGAT  
CTCTTTGCGGTCAAGACAAATACGAATTGCACGCCAACCCAAGAACGGATCNNTTTNTCCTT

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**115. *Providencia stuartii* (SEQ ID NO. 115)****PSTU**

GCCTCTGCATGTGATGCATCAATGACTTGCTTAATCAGTTCAATACAGCAGGCGACATTGGATTGTAGAGGTGAG  
AAATCAGCTCATTACCACGGTCAACAGCTAGAGTATATTGAGTGAGATCGTTTCGTCCCAATACTGAAAAAGTCAA  
CTTCTTTTGCTAAATGATGAGCAATAACCGCTGCGGCAGGGGTTTCCACCATGACACCAACTTCGATTGATTCAT  
CAAAGGCTTTGCCTTCTTCACGTAATTGACCTTTTAGCATCTCAAGTTCTGCTTTTAGTTTCGGAAGTTCCTCAA  
CGGAAATAATCATCGGGAACATAATACGCAGTTTACCAAAACTTGAGGCTCTTAAATAGCTCTTAACTGAGAAT  
GTAGAATTTCTTTGCGATCAAGGCAAATACGAATTGCCCGCCAGCCCAAGAACGGT

**116. *Proteus vulgaris* (SEQ ID NO. 116)****PVUL**

CCTTCTGCATGTGATGCATCAATAACCTGTTTTATCAGGTTAAGTACTGCTGGTGACATTGGATTATACAGATGA  
GATATCAGCTCATTTCACGGTCTACAGCCAGAGTATATTGTGTTAGATCGTTAGTCCCAATACTGAAAAAGTCA  
ACTTCTTTTGCCATGAGACGTGCCATTACGGCCGCCGAGGGGTTTCAACCATGACACCGACTTCGATAGACTCA  
TCGAAAGTTTTGTTTTCTGCACGAAGCTGGCTTTTTCAGTATTTCAAGTTCTGCTTTCAATGCGCGAATCTCTTCA  
ATAGAGATAATCATTGGAAACATAATGCGTAGTTTACCAAAAGCAGATGCTCTTAAGATAGCACGTAATTGCGAA  
TGAAGGATCTCTTTACGGTCAAGACAAATACGAATTGCTCTCCAACCCAAGAACGGTCNNTTTTTTTCTTA

**117. *Staphylococcus simulans* (SEQ ID NO. 117) SSIM**

TTCTCCGCACATACCTGTCCATTTACCTTCAGCATGAGACGCTTCGATAACACGTTGTACCAAGCGTAAATAGC  
TGGGTTATATGGTTGGTATAAATAAGACACACGTTCTGACATACGGTCAGCTGCCATTGTATATTGGATTAAGTC  
ATTTGTTCCGATACTGAAGAAGTCTACTTCTTTCGCAAAGACATCAGCAAGTGCTGCTGTGATGGAATTTCAAC  
CATGATACCGACTTCGATATCATCTGAAACTTCAACACCTTCATTTTTAAGGTTTTGACGTTCTTCTTCTAATAA  
TGCTTTTCGCATCACGGAATTCTTGAATTGTCGCAACCATTGGGAACATAATGTTTAATTTTCCGTATACTGAAGC  
ACGTAATAACGCGCGTAATTGCGGACGGAAAATTTCTGGTTGTGCTAAGCACAGCGGATTGCACGATAACCCAA  
GAACGGAT

**118. *Staphylococcus sciuri* (SEQ ID NO. 118)****SSCI**

CTCCGCACATACCAGTCCATTTACCTTCTTTATGAGAAGCTTCAATTACTTGCTTAACCTAAGCGAAGAATTGCAG  
GGTTATATGGTTGGTATAAGTAAGAAACACGCTCAGACATACGGTCAGCAGCCATTGTATATTGGATTAAATCAT  
TCGTACCAATACTGAAGAAATCAACTTCTTTAGCAAAGATGTCTGCAAGTGCTGCAGTAGATGGAATTTCTACCA  
TAATACCGATTTTCGATATCATCCGCAACGTTAACACCTTCAGAACTAATTTTTCTTTTCTCAAGTAAGATTG  
CTTTAGCATCTCTAAATTCTTTAATAGTTGCAATCATAGGGAACATGATATTTAACTTACCAAATTCAGATGCGC  
GTAATAAAGCTCTTAATTGTGTTCTAAAGATTTTCAGTTTGATCTAAACATAAACGAATCGCTCTATATCCCAAGA  
ACGG

**119. *Staphylococcus capitis capitis* (SEQ ID NO. 119) SCAPCA**

TCCGCACATACCAGTCCATTTACCTTCTTTATGAGAAGCTTCAATGACTTGCTTAACAAGACGTAATATAGATGG  
GTTATATGGTTGATATAAATAAGATACACGCTCTGACATACGATCAGCAGCTAGTGATATTGAATTAAATCATT  
TGTACCAATACTAAAGAAATCTACTTCCTTCGCAAAGACATCTGCTAATGCAGCAGTTGCTGGAATTTCAACCAT  
GATACCTAATTCAATATCATCAGAAATGTCATAACCTTCATTTTCAAGGTTTTTCTTTTCTCTAAAAGAATTGC

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TTTGGCATCACGGAATTCTTTAATAGTAGCAACCATTTGGGAACATGATATTTAATTTACCGTAAGCAGATGCACG  
TAATAATGCACGTAATTGCGGTCTAAAAATATCTTGTTGAGCTAAACATAAACGAATTGCTCTATAACCCAAGAA  
CGGA

120. *Staphylococcus warneri* (SEQ ID NO. 120) SWAR

CCGCACATACCAGTCCATTTACCTTCTTTGTGAGAAGCTTCAATGACTTGTTTTACTAAGCGTAAAATTGAAGGG  
TTGTATGGTTGATATAAGTAAGATACACGTTACAGACATACGGTCAGCTGCTAATGTGTATTGGATTAAGTCATTT  
GTACCAATACTAAAGAAATCTACTTCTTTAGCAAATACATCAGCTAATGCTGCTGCTGCTGGTATTTCAACCATG  
ATACCTAACTCAATATCTTCAGAACTTCATAACCTTCATTTTGAAGATTTCTTTTTCTTCTAATAACATTGCT  
TTAGCATCACGGAATTCCTTGATAGTTGCTACCATTGGGAACATGATATTTAATTTACCATAAACTGATGCACGT  
AATAACGCGCGTAATTGTGGTCTGAAAATATCAGGTTGAGCTAAGCAAAGACGAATCGCTCTGTATCCCAAGAAC  
GGATCATTCTCTTA

121. *Staphylococcus cohnii urealyticus* (SEQ ID NO. 121) SCOHURE

CCGCACATTCCAGTCCATTTGCCTTCTTTATGAGAAGCATCAATCACTTGTTGCACTAAACGTAAAATTGCTGGA  
TTGTATGGTTGATACAAGTAAGATACTCGCTCTGACATACGATCCGCGGCCATTGTATATTGAATTAATCGTTC  
GTTCCGATGCTGAAGAAATCTACTTCTTTAGCAAAAACATCTGCTAATGCTGCAGTTGAAGGAATTTCTACCATG  
ATACCAACTTCTATATCATCAGATACTTCAATACCTTCATTTGTTAAATTTCTTTTTCTTCTAATAACAATGCT  
TTCGCATCACGGAATTCCTTAATTGTGCTACCATTGGGAACATAATATTTAAATTTCCATAAGCTGACGCACGT  
AATAAAGCACGCAATTGCGGTCTGAAAATGTGAGGTTGATCTAAACATAAACGAATCGCACGGTATCCCAAGAAC  
GGNT

122. *Staphylococcus schleiferi scheiferi* (SEQ ID NO. 122) SSCH

CCGCACATACCTGTCCATTTACCTTCTTTATGAGATGCTTCAATTACTTGCTTAACTAAGCGTAAAATTGAAGGA  
TTGTAAGGTTGGTAAAGATATGATACACGTTCTGACATACGGTCAGCTGCCATCGTATATTGAATTAAGTCATTC  
GTTCCAATACTAAAGAAGTCAACTTCTTTAGCAAAAACATCAGCTAAAGCTGCTGTAGATGGAATTTCCACCATA  
ATACCTAACTCAATATCATCGCTAACTTCAACGCCTTCTTGTTTTAAGTTTTCTTTTTCTTCAAGAAGAAGCGCT  
TTTGCATCGCGGAATTCCTTAATCGTCGCAACCATTGGGAACATAATGTTTCAGTTTTCCGTAAGTTGAAGCGCGT  
AATAACGCTCTTAATTGTGGACGGAAAATTTAGGTTGATCTAAACAAAGACGAATTGCACGGTATCC

123. *Staphylococcus intermedius* (SEQ ID NO. 123) SINT

CCGCACATACCTGTCCATTTGCCCTCTTGGTGAGAAGCGTCAATCACTTGTTTAATTAAACGTAAGNATTGATGG  
ATTATATGGTTGGTAAAGATAAGATACACGTTCTGACATACGGTCTGCAGCCATTGTGTATTGAATTAATCGTT  
TGTACCGATACTGAAGAAATCCACTTCTTTGCAAATACATCTGCAAGTGCGGCTGTTGCAGGGATTTCAACCAT  
GATACCTANTTCGATATCGTCGCTCACTTCTACGCCTTCTTGTTTCAAGTTTTCTTTTTCTTCAAGAAGTAACGC  
TTTCGCATCACGGAATTCCTGAATCGTTGCCACCATTGGGAACATAATATTCAATTTACCGTATGCTGAAGCTCT  
TAATAATGCACGTAATTGTGGACGGAAAATTTAGGTTGATCTAAACATAAACGAATCGCACGGTAACCCAAGAA  
CGGATTCAT

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**124.      *Staphylococcus cohnii cohnii* (SEQ ID NO. 124) SCOHCOH**

CCGCACATCCCTGTCCATTTACCTTCTTTATGACTGGCATCAATAACTTGTTTCATCAGTCTAAGAAATCGCTGGG  
TTATAAGGCTGGTAAAGATAAGAGACGCGTTCATCATACGGTCTGCAGCCATCGTATATTGAATAAGATCATTC  
GTACCGATACTAAAGAAATCAACCTCTTTCGCAAAGATATCGGCCATTGCTGCTGTAGAAGGAATCTCTACCATG  
ATGCCAAGCTCGATATCGTCAGCAACTTTAACTTTATCTGCAATTAAATTGGCTTTCTCTTCTTCTAAGATTGCT  
TTCGCATCACGGAATTCGTTGATAGTCGCAATCATCGGGAACATGATGCTCAGTTTACCGTGGATGGATGCACGT  
AATAACGCACGAAGCTGTGTTCTAAAGATATCCTGCTGATCCAGACAAAGTCGAATCGCACGGTATCCAANGAAC  
GGNTTCAT

**125.      *Staphylococcus capitis uralyticus* (SEQ ID NO. 125)      SCAPURA**

CCGCACATACCAGTCCATTTACCTTCTTTATGAGAAGCCTCTATTACTTGCTTAACAAGACGTAAAATAGAAGGA  
TTATATGGTTGATATAAAATAAGATACACGTTCGACATACGATCAGCAGCTAGTGTGTATTGAATTAAGTCATTA  
GTACCGATACTAAAGAAGTCTACTTCCTTCGCAAAGACATCTGCTAATGCAGCAGTTGCTGGAATTTCAACCATG  
ATACCTAATTCGATATCGTCAGAAATGTCATAACCTTCATTTTCAAGGTTTTCTTTCTTCTAAAAGAATCGCT  
TTAGCATCACGGAATTCCTTGATAGTAGCAACCATTTGGGAACATGATATTTAATTTACCGTAAGCAGATGCACGT  
AATAATGCACGTAATTGCGGTCTGAAAATATCTTGTTGCGCTAAACATAAACGAATTGCTCTATAACCCAAGAAC  
GGNTTCATNTCTTA

**126.      *Staphylococcus gallinarum* (SEQ ID NO. 126)      SGAL**

CCGCACATACCTGTCCATTTACCTTGTTTAACTAAACGTAAAATTGAAGGATTATATGGTTGATACAAGTATGAT  
ACACGTTCTGACATTCTATCTGCAGCCATAGTGTATTGAATTAAATCATTTGTACCGATACTAAAGAAGTCAACC  
TCTTTAGCAAATACATCAGCTAAAGCTGCTGTAGAAGGAATTTCTACCATGATACCTAATTCGATATCATCAGAT  
ACTTCAACACCTTCTTGTTAAATTGTCTTCTCTTCAAGAAGTAATGCTTTGGCATCACGGAATCTTGAATT  
GTAGCAACCATTTGGGAACATGATATTTAACTTACCGAATGCAGATGCGCGTAATAATGCACGCAATTGCGGTCTG  
AAAATATCAGGTTGATCCAAGCATAAACGTATCGCACGATATCCCAAGAACGGATTTCATNTCTTA

**127.      *Staphylococcus auricularis* (SEQ ID NO. 127)      SAURICU**

CCGCACATGCCAGTCCATTTACCTTCTTTATGAGAAGCTTCGATGACTTGTTTGCTCAACCAAGCGTAAAATAGC  
TGGATTATATGGTTGATAAAGGTATGATACGCGTTCTGACATGCGGTCTGCAGCCATTGTATATTGAATTAAGTC  
GTTTGTACCGATACTAAAGAAGTCGACTTCTTTCGCAAAGACATCTGCTAAAGCAGCTGTTGATGGAATTTGAC  
CATAATACCTAATTCATATCATCTGAGACTTCAACTCCCTCTTGTTCTAAGTTTGCTTTTTCTTCTTCCAACAA  
TGCTTTAGCATCACGGAATTCCTGAATTGTGCAACCATTTGGGAACATGATATTGAGTTTTCCGTACGTAGATGC  
ACGTAATAATGCACGTAATTGTGGACGGAAAATATCAGGTTGATCTAAGCATAAACGAATCGCACGATAACCCAA  
GAACGGATTTCAT

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128. *Staphylococcus caseolyticus* (SEQ ID NO. 128) SCAS

CCGCACATCCCTGTCCATTTACCTTCTTTATGACTGGCATCAATAACTTGTTTGATCAGTCTAAGAATC  
GCTGGGTTATAGGGCTGGTAAAGATAAGAGACGCGTTCATCATAACGGTCTGCAGCCATCGTATATTGA  
ATAAGATCATTTCGTACCGATACTAAAGAAATCAACCTCTTTTCGCAAAGATATCGGCCATTGCTGCTGTA  
GAAGGAATCTCTACCATGATGCCAAGCTCGATATCGTCAGCAACTTTAACTTTATCTGCAATTAAATTG  
GCTTTCTCTTCTCTAAGATTGCTTTTCGCATCACGGAATTCGTTGATAGTCGCAATCATTGGGAACATG  
ATGCTCAGTTTACCGTGGATGGATGCACGTAATAACGCACGAAGCTGTGTTCTAAAGATATCCTGCTGA  
TCCAGACAAAGTCGAATCGCACGGTATCCAAAGAACGGATTCA

129. *Staphylococcus xylosus* (SEQ ID NO. 129) SXYL

TGTGAAGCTTTAATCACTTGTTTTACTAAACGTAAAATTGAAGGATTGTATGGTTGATACAAGTAAGAAACACGC  
TCAGACATACGATCAGCAGCCATTGTATATTGAATCAAATCATTTGTACCAATACTAAAGAAATCAACTTCTTTA  
GCAAATACATCTGCTAAAGCAGCAGTTGATGGTATCTCTACCATAATACCTAATTCAATATCGTCAGATACTTCA  
ATGCCCTTCGTTTGTTAAATTCTCTTTTTCTTCCAATAATAATGCTTTTGCATCTCGAAACTCTTTAATTGTGGCA  
ACCATTGGGAACATGATATTTAATTTACCGTAAGTAGACGCACGTAACAATGCTCTTAATTGTGGTCTGAAAATA  
TCAGGTTGATCTAAGCATAAACGAATTGCACGATATCCCAAGAACGGATCATTTTTTCGTAA

130. *Klebsiella pneumoniae* (SEQ ID NO. 130) KPNE

CCGCACATGCCAGTCCATTTACCTTCAGCGTGAGAAGCATCAATAACTTGCTTAATCAGATTCAGTACAGACGGT  
GACATCGGCTGGTAAAGATGTGAAATCATATCATTACCACGGTCAACTGCCAGAGTATATTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCCAGATGACGAGCAATAGTCGCCGAGCCGGTGTTCACCATC  
ACGCCGATCTCAATGGATTTCGTCAAATGCTTTACCTTCGTCACGCAGTTCCTGTTTGATAGATTCGATCTCTTTC  
TTCAGCGCACGCACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAGCTTACCGAAAGCGGAGGCGCGC  
AGGATGGCGCGAACCTGGTCGCGCAGGATCTCTTTACGATCCATCGCAATACGCACGGCAGCCAGCCNAAGAAC  
GGAT

131. *Salmonella typhimurium* (SEQ ID NO. 131) STPM

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTGCGCGCAGCCGGTGTTCACCATC  
ACGCCAATCTCAATGCTTTTCGTCAAATGCTTTACCTTCGTCACGCAGTTCCTGTTTGATAGATTTCAATCTCTTTC  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNANGAAC  
GGAT

132. *Escherichia coli* O157 :H7 (SEQ ID NO. 132) EC0157

CCTGCCATTTACCGCACATGCCAGTCCATTTGCCTTCAGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTC  
AGCACGGACGGTGACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGAGTGTACTGC  
GTTAAATCATTGGTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGTGCAATTGTTGCGGCAGCCGGT  
GTTTCCACCATACGCCGACTTCAATTGACTCGTCAAACGCTTTACCTTCGTCGCGCAGTTCCTGTTTGATAGATT



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TCGATCTCTTTGCGCAGTGCACGCACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAA  
GCCGAGGCACGCAGGATAGCGCGGAGCTGATCGCGCAGGATCTCTTTACGATCCATTGCGATACGGATAGCGCGC  
CAGCCAAAGAACGGGTTCATTTCTTA

**133. *Escherichia coli* K12 (SEQ ID NO. 133)****ECOK12**

TCCTGCCATTTCTCCGCACATGCCAGTCCATTTGCCTTCAGCATGAGAAGCATCAATAACTTGCTTGATCAAGTT  
CAGCACGGACGGTGACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGAGTGACTG  
CGTTAAATCATTGGTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGTGCGATTGTTGCGGCAGCCGG  
TGTTTCCACCATTACGCCGATTTCAATTGACTCGTCAAACGCTTTACCTTCGTGCGCAGTTTCTGTTTGTAGAT  
TTCGATCTCTTTGCGCAGTGCACGCACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAA  
AGCCGAGGCACGCAGGATAGCGCGGAGCTGATCGCGCAGGATCTCTCTACGATCCATCGCGATACGGATAGCGCG  
CCAGCCCAAGAACGGATTTCATTTCTT

**134. *Citrobacter freundii* (SEQ ID NO. 134)****CFRE**

TCCCGCCATTTCTCCGCACATGCCAGTCCATTTGCCTTCAGCATGAGAAGCATCAATAACTTGCTTGATCAGCGT  
CAGCACAGATGGCGACATCGGTTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTG  
CGTTAAATCATTGGTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTTGCCGCAGCCGG  
TGTTTCCACCATCAGCCCAATCTCAATGCTCTCGTCAAATGCTTTACCTTCGTGCGCAGTTTCTGTTTGTAGAT  
TTCAATCTCTTTGCGCAGTGCACGCACTTCTTCAACAGAGATGATCATTGGGAACATAATGCGCAGTTTACCGAA  
AGCAGAGGCGCGCAGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTACGATCCATGGCGATACGCACGGCAG  
TCAGCCCAGGAATGGGTTCATCTCTT

**135. *Pseudomonas putida* (SEQ ID NO. 135)****PPUT**

TCCCGCCATTTCTCCGCACATGCTCACTGGCTTGCTTCACCATGGGCATCGCGCACCAACCGTGCTCAAGGCTTG  
CAGCTCCGCCGGGTGCAGGTAGTCGTACAGGTGCGCAACCCGCGGGTTGTTGCGGTCCACCGCCAGCAGGTACTG  
GGTCAGGTGCTTGGAGCCGACCGACAGGAAATCCACCTGCCGCGCCAGTTTCTTGGTCTGGTACACCGCCGCAGG  
TATTTCCACCATCAGCCCCACCGGCGGCATCGGCACATCGGTGCCTTCGTACGCACCTCGCCCCAGGCGCGGTG  
GATCAGGTGCAGCGCTTCTTCCAGCTCGTGGATGCCGGAATCATCGGCAGCAGGATGCGCAGGTTGTTTACGGCC  
CTCGCTGGCCTTGAGCATGGCGCGAGTCTGCACCAGGAAGATTTCCGGGTGGTCGAGGGTGACGCGGATGCCGCG  
CCAGCCTAAGAATGGATTTCATCTCGT

**136. *Shigella sonnei* (SEQ ID NO. 136)****SSON**

CCGGCCATTTACCACACATGCCAGTCCATTTGCCTTCAGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTC  
AGCACGGACGGTGACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGAGTGACTGC  
GTTAAATCATTGGTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGTGCAATTGTTGCGGCAGCCGGT  
GTTTCCACCATTACGCCGATTTCAATTGACTCGTCAAACGCTTTACCTTCGTGCGCAGTTTCTGTTTGTAGATT  
TCGATCTCTTTGCGCAGTGCACGCACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAA  
GCCGAGGCACGCAGGATAGCGCGGAGCTGATCGCGCAGGATCTCTTTACGATCCATCGCGATACGGATAGCGCGC  
CAGCCCAGGAACGGATTTCATCTCTTA

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**137. *Listeria innocua* (SEQ ID NO. 137)****LINN**

TCCTGCCATTTCTCCGCACATACCAGTCCATTTGCCCTCTTTATGAGAAGCATCAATTACCATTTTTACTAAGCG  
TAAAATAGATGGATTGTATGGTTGGTAAAGGTAAGAAACGCGTTCATTCATACGGTCAGCAGCCATTGTATACTG  
AATCAAGTCATTTGTTCCGATTGAGAAGAAATCAACTTCTTTTGCAAATTGATCAGCTAAAACCTGCAGCAGCAGG  
AATTTCAATCATAATTCCAAGTTCGATGGAATCAGATACTTCTGTTCCAGCAGCTTTTAGTTTCGCTTTTTTCATC  
TAGTAAAATATCGCGCGCTTGGCGGAATTCATTTACTGTTGCAATCATCGGGAACATAATTTTTAAGTTACCATA  
TACACTTGCGCGAAGTAGAGCGCGAAGTTGTGTACGGAATAATTCTTCATTCGCAAAACAAAGACGAATCGCAGC  
GAATCCTAAGAACGGGTTTCATTTCTG

**138. *Serratia marcescens* (SEQ ID NO. 138)****SMAR**

TTCTNNGANGGACTCTNTCNTAAANAGCATCAATAACCTGTTTGATCAGGCCAAGCACTGATGGGGACATCGGGT  
TATAGAGATGAGAAATCAGCTCGTTGCCGCGATCTACCGCCAGAGTATACTGGGTTAGATCGTTTGTCCCAATAC  
TAAAGAAGTCGACTTCTTTTCGCCAGGTGGTGAGCGATGACCGCCGCGAGCCGGTGTTCACCATCACGCCCACCT  
CGATGCTCTCGTCAAACGCCTTGCTTCTTCGCGCAGCTGCGCCTTCAGCGTCTCGATTTTCGCCTTTCAGATCGC  
GCACTTCTTCCACGGAGATGATCATCGGGAACATGATGCGCAGTTTACCGAACGCCGAGGCGCGCAGGATGGCGC  
GCAGCTGGGCGTGAGGATTTACGGCGGTCCATCGCGATGCGGATGGCGCGCCAGCCNAAGAACGGATTTCATTN  
TCTTA

**139. *Salmonella enterica* hadar (SEQ ID NO. 139)****SHAD**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTGCGCCGAGCCGGTGTTCACCATC  
ACGCCAATCTCAATGCTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**140. *Salmonella enteritidis* (SEQ ID NO. 140)****SENT**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTGCGCCGAGCCGGTGTTCACCATC  
ACGCCAATCTCAATGCTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**141. *Salmonella enterica* Brandenburg (SEQ ID NO. 141) SBRA**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTGCGCCGAGCCGGTGTTCACCATC

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ACGCCAATCTCAATGCTTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**142. *Salmonella enterica* derby (SEQ ID NO. 142) SDER**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTCGCCGCAGCCGGTGTTTCCACCATC  
ACGCCAATCTCAATGCTTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**143. *Salmonella enterica* virchow (SEQ ID NO. 143) SVIR**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTCGCCGCAGCCGGTGTTTCCACCATC  
ACGCCAATCTCAATGCTTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**144. *Salmonella enterica* paratyphi B (SEQ ID NO. 144) SPTB**

CCGCACATGCCAGTCCATTTACCTTCTGCATGAGAAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGT  
GACATTGGCTGGTAAAGGTGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTG  
GTGCCGATACTAAAGAAATCAACTTCTTTGGCTAAATGACGCGCAATTGTCGCCGCAGCCGGTGTTTCCACCATC  
ACGCCAATCTCAATGCTTTTCGTCAAATGCTTTACCTTCGTACGCAGTTCCTGTTTGTAGATTTCAATCTCTTTG  
CGCAGCGCGCGAACTTCTTCAACAGAGATGATCATCGGGAACATAATGCGCAATTTACCGAAAGCGGAGGCACGC  
AGAATCGCGCGAACCTGGTCACGCAGGATCTCTTTGCGATCCATGGCGATACGCACGGCGCGCCAGCCNAAGAAC  
GGAT

**145. *Streptococcus thermophilus* (SEQ ID NO. 145) STHE**

CCGCTCATACCAGCCCCATTTACCTTCAGCGTGAGCTGCCTTAATAACGTTGTTAATCAAGCGAAGGATTGATGGG  
TTATATGGTTGGTAAAGGTATGAAACTTGTTTCATTACACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTT  
GTACCAATTGAGAAGAAATCAACTTCTTTAGCAAATTGGTCAGCAAGCATTGCTGCAGCTGGGATTTCAATCATG  
ATACCTACTTCGATGTCGTTTGCAACGGCAACACCTTCAGCAACCAATTTAGCTTTTTCTTCTTCAAGAATACCT  
TTAGCAGTACGGAACCTCAGTCAACAAAGCAACCATTGGGAACATGATACGCAATTTACCGTGAACAGATGCACGA  
AGCAAGGCACGTAATTGAGTACGGAACATTTGGTTACCAGTTTCAGAGATAGAAATACGTAATGCACGGTAACCC  
AAGAACGG

**146.     *Streptococcus suis* (SEQ ID NO. 146) SSUI**

GCCCACATACCAGCCCATTTACCTTCTGCGTGTGCAGCCTTGATAACATTGTTAATCAAGCGAAGGATTGATGGG  
TTATATGGTTGGTAGAGGTATGAAACTTGTTTCATTTCATACGGTCTGCAGCCATTGTGTACTGGATAAGGTCGTT  
GTACCGATTGAGAAGAAGTCAACTTCTTTGGCAAATTGGTCTGCAAGCATTGCTGCTGCAGGGATTTCAATCATG  
ATACCAACTTGGATATCATCCGCAACTGCTACACCTTCAGCCAACAAGTTTGCTTTTTCTTCATCAAGGATTGCT  
TTTGCTGCACGGAATTCAGTCAACAAGGCAACCATTGGGAACATGATACGAAGTTTACCATGTACTGATGAACGA  
AGAAGGGCACGCAACTGAGTGCAGAACATTTGGTTACCAGTCTCAGAGATAGAGATACGAAGGGCACGGAAACCN  
AAGAA

**147.     *Bacillus pseudomycoïdes* (SEQ ID NO. 147) BPMS**

CCGCACATACCAGCCCATTTTCCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGGCGTAAAATAGATGGA  
TTATACGGTTGGTATAAGTAAGATACACGTTTCATTTCATACGGTCTGCAGCCATTGTGTATTGGATTAGGTCGTTT  
GTTCCGATAGAGAAGAAATCAACTTCTTTTGCAAAGTCTGCTAATACTGCAGAAGCGGGAATTTCTACCATC  
ATACCTACCTCAATAGCATCAGAAACAGTTGTACCAGCTTGAACAAGTCTTTCTTTCTTCTAATAAAATTGCT  
TTTGCTTGACGGAATTCATCAAGAGTTGCAATCATTGGGAACATAATTTTTAAATTACCATATACGCTTGCACGA  
AGCAATGCACGAAGTTGTGTACGGAACACATCTTGTCTTCAAGGCATAAGCGAATCGCACGGTAACCCAAGAA

**148.     *Staphylococcus lugdunensis* (SEQ ID NO. 148) SLUG**

CCGCACATACCAGTCCATTTACCTTCTTTATGAGAAGCTTCAATCACTTGTTTCACTAGACGTAAAATAGCTGGA  
TTATATGGTTGATAAAGGTATGATACACGTTCTGACATGCGGTCAGCAGCCATTGTGTATTGAATCAAATCATTA  
GTACCGATACTGAAGAAATCAACTTCTTTAGCAAAGATATCAGCTAATGCAGCTGTTGATGGGATTTCTACCAT  
ATTCCGAGCTCGATATCATCTGACACGTCATGTCCTTCATTTTTTAGATTTTCTTTTCTTCTAAAAGAAGCGCT  
TTGGCATCTCTAAACTCATTAATAGTAGCAACCATTGGGAACATAATATTTAATTTTTCCATATGCTGAAGCACG  
CAAAAGAGCGCGCAACTGTGGTCTGAAAATATCAGGTTGATCTAAGCACAAATCGAATCGCACGGTAACCNAAAGAA

**149.     *Cryptococcus neoformans* (SEQ ID NO. 149) CNEO**

CGACAGTTATGACCGACCCGGATCTTCTGTGATGGATTTGAGTAAGAGCATATATGCTGGGACCCGAAAGATGGT  
GAACTATGCCTGAATAGGGCGAAGCCAGGGGAAACTCTGGTGGAGGCTCGTAGCGATTCTGACGTGCAAATCGAT  
CGTCGAATTTGGGTATAGGGGCGAAAGACTAATCGAACCATCTAGTAGCTGGTTCCTGCCGAAGTTTCCCTCAGG  
ATAGCAGAACTCGCATCAGTTTTATGAGGTAAAGCGAATGATTAGAGGCCTTGGGGACGAAACGTCCTTAACCT  
ATTCTCAAACCTTAAATGTGTAAGAAGCACTTGTCACCTTAATTGGACGAGCGCATGCGAATGAGAGTTTCTAGTG  
GGCCATTTTTGGTAAGCAGAACTGGCGATGCGGGATGAACCGATCGCGAGGTTAAGGTGCCGGAATACACGCTCA  
TCAGACACCACAAAAGGTGTTAGTTCATCTAGACAGCAGGACGGTGGCCATGGAAGTCGGAATCCGCTAAGGAGT  
GTGTAACAACCTCACCTGCCGAATGAACTAGCCCTGAAAATGGATGGCGCTCAAGCGTGTTACCCA

**Figure 6. Molecular marker III (SpyM\_0902 & SpyM\_0903) sequences amplified from Gram positive bacteria (SEQ ID NOs 150-180).**

**150.        *Streptococcus thermophilus* (SEQ ID NO. 150)        *STHE***  
TTGNAACGGCTTATGCTGTAGNACAAGNACACCGAAGGGGCAAGGGATAAGACCCGAAACTCTCAGGTAAAAGGA  
CAGAAAGCATTGAATGTTTTTAACCTTCAGTAATAGCTTTGTACTTTCAGAGGTCTGGTTAAGCCAAACCTCTTT  
TTGATGTCTCGGTCTAAGGAGATTTTAAACGCATGTTAGACTTTTTCACTTCCATTGATGACTTTGTATGGGGAC  
CTCCCCCTTCTTGTCTTCTTGTAGGAAGTGGTATCTACCTTACAATCCGTCTTGGACTTTTGCAAATCATTCGTC  
TGCCTAAAGCCTTTAACTTATCTTTGCTGAAGATAAAGGAGAGGGTGATATTTCTAGTTTTGCAGCCCTTGCCA  
CAGCACTTGCTGCAACTGTTGGTACTGGTAACATTGTTGGTGTGCGACAGCCATTAAGACTGGTGGGCCTGGTG  
CTCTTTTCTGGATGTGGATTGCTGCTTTCT

**151.        *Enterococcus villorum* (SEQ ID NO. 151)        *SVIL***  
CCGAAGGGGCAAGGGATAAGACCCGAAACTCTCAGGTAAAAGGACAGAAAGCATTGAATGTTTTTAACCTTCAGT  
AATAGCTTTGTACTTTCAGAGGTCTGGTTAAGCCAAACCTCTTTTTGATGTCTCGGTCTAAGGAGATTTTAAACG  
CATGTTAGACTTTTTCACTTCCATTGATGACTTTGTATGGGGACCTCCCCCTTCTTGTCTTCTTGTAGGAAGTGG  
TATCTACCTTACAATCCGTCTTGGACTTTTGCAAATCATTCGCTGCTTAAAGCCTTTAACTTATCTTTGCTGA  
AGATAAAGGAGAGGGTGATATTTCTAGTTTTGCAGCCCTTGCCACAGCACTTGCTGCAACTGTTGGTACTGGTAA  
CATTGTTGGTGTGCGACAGCCATTAAGACTGGTGGGCCTGGTGCTCTTTTCTGGATGTGGATTGCTGCTTTCTT  
TGGAATG

**152.        *Streptococcus pyogenes* (SEQ ID NO. 152)        *SPYO***  
TTANAGGCGCCGAGGGGCAAGGCATACTGCTCAATCTCTCAGGCAAAAGGACAGAAGGTAAAATACAAACACCAT  
TAAGAACAGTCTTAGTCTTTTTTGTGTTTGCTGTTTTATCATTGCTTCAGAAGTTGTCTCAAAGAAAGAGATAGC  
TTTTTTCTTTTGGCGTCTTCGATGACTTTTAGGAGAGAAAAGATGATAGCACTCGTTAAATTAATTGATAACCTTG  
TTTGGGGACCGCCCCTCTTAATTTTATTGGTTGGGACGGGGATTTACCTTACCAGTCATTTAGGATTAATTCAAA  
TCTTAAACTACCAAGAGCCTTTAACTCATTTTTTTCAGATGACGAAGGACATGGAGATATTTATCCTTTGCTG  
CTCTTGCAACTGCCCTTGCCGCTACTGTGGAAGTGGTAACATTGTTGGGGTTGCCACTGCTATCAAGTCTGGTG  
GTCCTGGAGCGCTCTTTTGGATGTGGGTTGCCGCTTTTTTTGGAATGG

**153.        *Streptococcus mutans* (SEQ ID NO. 153)        *SMUT***  
GCGCCGAGGGGCAAGGCTGTTTGCTCAAACTCTCAGGCAAAAGGACAGAAAAGAAAAAAGAATTTTTAATGTTG  
AAACAATTCTTATCTTCTAACTCTAGAGGTATCGTCAAGTATTGACAACCTCTTTTTTGATTTCCATTTTCGGTTT  
ATGAGGAGAAAAGTTTATATGTTAACATTTTTTAAAGCTCTAGACAGCTTTGTCTGGGGTGTTCCTTATTAGTT  
CTTTTAGTCGGTACTGGAATTTATTTGAGTACTCGCTTAAGATTATTGCAGGTATTGAACTCCCTTTAGCCTTT  
AAACTCATCTTTGCCGAGGACAAAGGGGAAGGTGATATTTGAGTTTTGCGGCTTTAGCTACTGCTCTTGCTGCC  
ACTGTTGGAAGTGGAAATATCGTTGGTGTGCGCACTGCAATCAAAGCTGGCGGTCCGGGAGCACTCTTTTGGATG  
TGGATAGCAGCTTTTTTTGGAATGGC

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**154. *Streptococcus agalactiae* (SEQ ID NO. 154) SAGA**

AAGTAGCAACATCTTTGTATTGACACCAAGNATGTGCTCTAGGCGCCGAAGGGGCAAGAAGAGTAAAACAACTCC  
TCCAATCTCTCAGGCAAAAGGACAGAAGCTAAAAGCCAATATTAATAATGAGTAGTAAGCTTATTAAGTTTACTA  
CTACCTTTATTTGTGCGCTTTTGTAGCTAGCATCTTTCAGAAGTTATCTCTTTTAGAGATAACTTTTTTCGTTTCA  
TTACAGAATCCATAGGTATGTCATGTATCAAAGGAGAACATATGCTAACACTTTTTACTCATATCAATAGCTTCG  
TTTGGGGTCCACCTTTACTTGCTTTATTAGTCGGAACAGGTATTTACCTATCATTTTCGCTTAGGTTTTGTTCAAT  
TGAGACAACCTTTCTAGAGCTTTCAAATTGATTTTCCGAGAAGATAACGGACAAGGGGATATTTCAAGTTATGCTG  
CTCTTGCAACTGCTCTTGCTGCAACGGTAGGGACAGGTAATATCGTTGGTGTGGCTACGGCTATTAAATCTGGAG  
GACCAGGAGCTTTGTTTTGGATGTGGGTAGCCGCCTTTTTTGAATGGCCC

**155. *Streptococcus sanguis* (SEQ ID NO. 155) SSAN**

TAGAACCGCTCAAACCTCTCAGGTAAAAGGACAGAGCGAAGAGGCAGGGATTTCCCTACTCCAGCACATCCAGGAG  
TACATGTTTTGCATGTGCTCTTTCTTTTTCTCGGTGTGAAAGGAGCTTATATCATGTTGGAAATATTGAATCGT  
CTGGATTCTTTTGTGTTGGGGTCCGCCCCCTGCTCATTTTGTGTTGGTACTGGTATCTATCTCAGTCTGCGTCTG  
GGCTTGCTGCANATTTTTCGACTTCCTCGTGCCTTTTCGGCTAATCTTTGTATCGGACGAGGAGCATCAGGGCGAT  
GTCTCTAGCTTTGCGGCTCTCTGTACGGCTCTAGCCGCGACTGTGGGAACGGGAAATATCATCGGAGTGGCAACT  
GCCATTAAAACCGGTGGACCGGGGGCGCTCTTCTGGATGTGGGTGGCTGCTTTCTTTGGAATGGC

**156. *Streptococcus oralis* (SEQ ID NO. 156) SORA**

GGGCAAGGCAGGTAACCTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCTTTTTGGCATTATCT  
AAGCATTCCAGAGTACATGTATCTTGCATGTACTCTTTCTTTTGGGGTTGAAAGATAGGAGAAGGACATGTTAGA  
ATTGCTTAAAGCGCTTGATGCTTTTGTGTTGGGGGCTCCCCTCTTGATCTTATTGGTCGGAACGGGTATCTATTT  
GACCATCCGACTGGGCTTTTGCAGGTACTCGTCTCCCTAAGGCCCTTTCAGTTGATCTTTACCAAGGACAAGGG  
GCACGGCGATGTGTGAGCTTTGCTGCTCTCTGTACGGCTCTAGCAGCCACAGTTGGTACGGGAAATATCATCGG  
GGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCTCTTTTGGATGTGGATGGCGGCCTTCTTTGGAATGGC

**157. *Streptococcus suis* (SEQ ID NO. 157) SSUI**

TTTTGGCCCCGANGGGCAAGGTAGTCCTGCTTGAAAAGTAGAGCTACTGAAACTCTCAGGTAAAAGGACAGAGCG  
TTGAAAAATAGGCTTTTTCTGTATTTTTCACGTTGATTCTAGAGGTTGAAGTGTTTCAGCCTCTTTTTGTTTTTCC  
GGCAGCTTTATCGGGTTAGAAACGCTTAGGAGGAATATGTTAGAACTATTTAAGGCTATCAACAATCTTGTTTG  
GGGACCGCCCCCTCTTGTTACTATTGGTCGGAACGGGTGTCTATTTTACCCTACGGTTGGGAGTATTTACAGATTGG  
CAAATTGCCGACGGCTTTTCTGCTGATTTTCTCCAGTGACCAGTCTGGTCAGGGAGATGTGTCCAGTTTTGCGGC  
TCTGTGTACGGCTTTAGCAGCGACAGTTGGTACAGGAAATATCGTCGGAGTTGCGACAGCTATTACTACAGGTGG  
TCCTGGGGCTCTTTTCTGGATGTGGGTGCGGCCTTTTTTGAATGGC

**158. *Staphylococcus simulans* (SEQ ID NO. 158) SSIM**

ATCCGGCTTTGAGTTTAAAGCTATTGATGCTTTAATTACGAACTTCCATCTGCCGAAGTCCACACTTGTATGTT  
AGTTTCAGCATTCAGTTCAAACAATATATTTTAAATGCATACCAAACAGCTGTCGAAATGAAATATCGATTCTT  
CAGCTTTGGTGATGCAATGTTAATTATTTAAGGGAGTCGTGAAAAAGTTATGCCCTGCAGTAACCTATGAACATAT  
CAAAACATGTAAACAATCCGGTGCAAGGTTAGGAATCGTGCATACACCGCACGGTTCGTTTGAAACACCTATGTT

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TATGCCAGTAGGAACCTCAAGCTACCGTTAAACTATGAGTCCTGAAGAACTAAGGGAAATTAATGCACAAATCAT  
TTTAGGCAACACATACCATTTATGGTTGCAACCCGGCAATGACATTATTAAACGCGCGGGTGGTTTGCATAAATT  
TATGATTTGGAATGGCCAC

**159.      *Enterococcus faecalis* (SEQ ID NO. 159)      EFLS**

GTAAAGGCACCGAAGGGGCAAGGCAGGTAACCTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCT  
TTTTGGCATTTATCTAAGCATTCAGAGTACATGTATCTTGCATGTACTCTTTCTTTTGGGGTTGAAAGATAGGA  
GAAGGACATGTTAGAATTGCTTAAAGCGCTTGATGCTTTTGGTTGGGGGCCTCCCCTCTTGATCTTATTGGTCGG  
AACGGGTATCTATTTGACCATCCGACTGGGCCTTTTGCAGGTTACTCGTCTCCCTAAGGCCTTTCAGTTGATCTT  
TACCAAGGACAAGGGGCACGGCGATGTGTCGAGCTTTGCTGCTCTCTGTACGGCTCTAGCAGCCACAGTTGGTAC  
GGGAAATATCATCGGGGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCTCTTTTGGATGTGGATGGCGGC  
CTTCTTTGGAATGGCCC

**160.      *Streptococcus pneumoniae*      (SEQ ID NO. 160)      SPNE**

GTAAAGGCACCGAAGGGGCAAGGCAGGCAACTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCT  
TTTAGCATTTATCTAAGCATTCAGAGTACATGTATCTTGCATGTGCTCTTTCTTTTGGGGTTGAAACGATAGG  
AGAAGGAAATGTTAGAATTGCTTAAATCAATCGATGCTTTTGGTTGGGGACCGCCCCCTCTTGATTTTATTGGTCG  
GAACAGGGATTTACCTAACCATGCGGCTAGGACTCTTGACAGGTTTTGCGTCTGCCAAGGCCTTTCAGCTTATTT  
TTATCCAGGATAAGGGACATGGTGATGTATCCAGTTTTACAGCTCTGTGTACAGCCTTGGCATCAACTGTTGGAA  
CAGGAAATATCATAGGAGTTGCGACGGCTATCAAGGTTGGTGGACCAGGAGCTCTATTTTGGATGTGGATGGCGG  
TTTTCTTTGGAATGGCCC

**161.      *Enterococcus durans*      (SEQ ID NO. 161)      EDUR**

NGNCCGAGGGGCAAGGTCAGNACAACCTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCTTTTTTA  
GCATTTATCTAAGCATTCAGAGTACATGTATCTTGCATGTGCTCTTTCTTTTGGGGTTGAAACGATAGGAGAAG  
GAAATGTTAGAATTGCTTAAATCAATCGATGCTTTTGGTTGGGGACCGCCCCCTCTTGATTTTATTGGTCGGAACA  
GGGATTTACCTAACCATGCGGCTAGGACTCTTGACAGGTTTTGCGTCTGCCAAGGCCTTTCAGCTTATTTTTATC  
CAGGATAAGGGACATGGTGATGTATCCAGTTTTACAGCTCTGTGTACAGCCTTGGCATCAACTGTTGGAACAGGA  
AATATCATAGGAGTTGCGACGGCTATCAAGGTTGGTGGACCAGGAGCTCTATTTTGGATGTGGATGGCGGTTTTTC  
TTTGAATGGCCC

**162.      *Bacillus anthracis* 1978 (SEQ ID NO. 162)**

NGAGGAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCTCAGGTAAAAGGACAGAGACAAG  
CGAAAAGAAAATGCCGATTTGTATCGGTTTTATTTTTCTATCCCTTGTTTCTCCAGAGACCATTTTCAATTTACTTGAA  
GTGGTTTTTTATTTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGTATTAGAACAAATCAATCACT  
ATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCTCACAGTGCCTTTAAAAGGTTTAC  
AGTTTAGTAAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGATACATCTTCCTCTGGAGATATTA  
GCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAATATAGCTGGTGTGCAACTGCTG  
TGACGATCGGTGGACCTGGTGCAATCTTTTGGATGTGGATTACTGCTTTGTTTGAATGGCCCAAAA

**163. *Bacillus anthracis* Sterne (SEQ ID NO. 163)**

TNCNCGCTTTAAATAGCGTAGNAGGCAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCTC  
AGGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAG  
AGACCATTTTCACTTGAAGTGGTTTTTATTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAG  
TATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCTCA  
CAGTGCCTTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGATA  
CATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAATA  
TAGCTGGTGTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTGGATGTGGATTACTGCTTTGTTTG  
GAATGGCCCCAAAA

**164. *Bacillus anthracis* Butare (SEQ ID NO. 164)**

NNCNCNCGCTNTAAATAGCGTAGAGGCAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCT  
CAGGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCA  
GAGACCATTTTCACTTGAAGTGGTTTTTATTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAA  
GTATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCTC  
ACAGTGCCTTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGAT  
ACATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAAT  
ATAGCTGGTGTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTGGATGTGGATTACTGCTTTGTTT  
GGAATGGCCCCAAAA

**165. *Bacillus anthracis* 1655H85 (SEQ ID NO. 165)**

TNTNCGCTTTNATAGCGTAGTAGGCAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCTC  
AGGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAG  
AGACCATTTTCACTTGAAGTGGTTTTTATTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAG  
TATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCTCA  
CAGTGCCTTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGATA  
CATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAATA  
TAGCTGGTGTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTGGATGTGGATTACTGCTTTGTTTG  
GAATGGCCCCAAAA

**166. *Bacillus anthracis* Coda-Cerva (SEQ ID NO. 166)**

CTNTNCGCTTTAAATAGCGTAGAGGCAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTC  
TCAGGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCC  
AGAGACCATTTTCACTTGAAGTGGTTTTTATTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAA  
AGTATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCT  
CACAGTGCCTTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGA  
TACATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAA  
TATAGCTGGTGTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTGGATGTGGATTACTGCTTTGTT  
TGGAATGGCCCCAAAA



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**167.      *Bacillus anthracis* 2054H82 (SEQ ID NO. 167)**

TNCNCGCTTTNAATAGCGTAGAGGCAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCTCA  
GGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAGA  
GACCATTTTCACTTGAAGTGGTTTTTATTTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGT  
ATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCTCAC  
AGTGC GTTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACCTAGCTTTTAAAAAATCAGAAGATAC  
ATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAATAT  
AGCTGGTGTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTTGGATGTGGATTACTGCTTTGTTTGG  
AATGGCCNAAAA

**168.      *Bacillus cereus* ATCC 10987 (SEQ ID NO. 168) BCER10987**

TGCTTGCTAGAGCGCGGAGGAAAACGAGCACCGAAGGAGCAAATCCGCTACTTTAGCGGATAATCTCTCAGGTAA  
AAGGACAGAGACAAGCGAAAGAAAAGCCGATTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAGAGACCAT  
TTCATTTACTTGAAGTGGTTTTTATTTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGTATTAGA  
ACAACTGAATCAATACGTGTGGGGATTACCAACTTTGTTGCTACTCGTTGGAACAGGTATCATTCTCACAGTGCG  
TTTAAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACCTAGCATTTAAAAAATCAGAAGATGCCTCTTC  
TTCTGGAGATATTAGTCACTTCCAAGCACTTATGACAGCTATGGCCGCAACGATTGGTATGGGAAATATAGCCGG  
TGTTGCAACAGCTGTTACAATTGGTGGTCCTGGTGCAATATTTTGGATGTGGATTACCGCTTTATTTGGAATGGC  
CCAAAA

**169.      *Bacillus cereus* ATCC 14579 (SEQ ID NO. 169) BCER14579**

TAGCAGTCGCGGCGGAAAAACGAGCACCGAAGGAGCAAATCCGCTACTTTAGCGGATAATCTCTCAGGTAAAAGG  
ACAGAGACAAGCGAAAGAAAAGCCGATTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAGAGACCATTTCA  
TTTACTTGAAGTGGTTTTTATTTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGTATTAGAACAA  
CTAAATCAATACGTGTGGGGATTACCAACTTTGTTGCTACTCGTTGGAACAGGTATCATTCTCACAGTGCGTTTG  
AAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACCTAGCGTTTAAAAAATCAGAAGATACTTCTTCTTCT  
GGAGATATTAGTCACTTCCAAGCACTCATGACAGCTATGGCCGCAACGATTGGTATGGGTAATATAGCCGGTGTT  
GCAACAGCGGTTACAATTGGTGGTCCTGGTGCAATATTTTGGATGTGGATTACCGCTTTATTTGGAATGGCCCCAA  
AA

**170.      *Bacillus thuringiensis* serovar *israelensis*      BTHUISR  
(SEQ ID NO. 170)**

TATAGCGCAGAGGAAAACGAGCACCGAAGGAGCAAATCCGCTACTATAGCGGATAATCTCTCAGGTAAAAGGACA  
GAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAGAGACCATTTCA  
TACTTGAAGTGGTTTTTATTTTTTCTAAAAAAGGAGAATACAGATGGAGACAGTAAGTAAAGTGTTAGAACAAA  
TCAATCACTATGTGTGGGGACTACCAACGTTGTTGTTACTCGTTGGTACTGGTATCATTCTCACAGTGCGTTTAA  
AAGGTTTACAGTTTAGTAACTATTATACGCTCACAACCTAGCTTTTAAAAAATCAGAAGATACATCTTCTTCTG  
GAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAATATCGCTGGTGTG  
CAACAGCTGTGACAATCGGTGGTCCCGGTGCAATCTTTTGGATGTGGATTACTGCTTTGTTTGAATGG

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**171.      *Bacillus mycoides* serovar MYC003 (SEQ ID NO. 171)****BMYC003**

GTGGAGGAAAGAGAGCACCGAAGGAGCAAATCCGCTAGCTAGTATAGCGGATAATCTCTCAGGTAAAAGGACAGA  
GACAAGCGAAAGAAAATGCCGATTTGGATCGGTTTATTTTTCTATCACTTGTTTCTCCAGAGACCATTTCATTTT  
GTGAAGTGGTTTTTTATTTTTTCTAAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGTACTAGAACAAATCAA  
TCATTACGTATGGGGATTACCAACCTTGTTCCCTACTCGTTGGAAGTGAATCATTCTTACAGTGCGTCTAAAAGG  
TTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGACACATCTTCTACTGGAGA  
TATTAGTCATTTTCAAGCACTTATGACCGCTATGGCAGCAACAATTGGAATGGGAAATATAGCTGGTGTGCAAC  
CGCTGTTACAATTGGTGGTCCCGGTGCAATATTTTGGATGTGGATTACCGCCCTGTTTGAATGGCCCCAAA

**172.      *Bacillus mycoides* serovar NRS306 (SEQ ID NO. 172)****BMYC306**

CGCTTCTATAGCGCGGAGGAAAACGAGCACCGAAGGAGCAAATCCGCTAATCTAGCGGATAATCTCTCAGGTAAA  
AGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCCAGAGACCAT  
TTCATTTCCCTGAAGTGGTTTTTATTTTTTCTAAAAAGGAGAATACAGATGGAGACAGTAAGTAAAGTATTAGA  
ACAAATTAATCAGTATGTGTGGGGGTTGCCAACTTTATTGCTACTCGTTGGAAGTGGTATCATTCTCACAGTGCG  
CTTAAAAGGTTTACAGTTTAGTAACTAATATACGCTCACAACTTGCTTTTAAAAAATCAGAGGATACATCATC  
TTCTGGAGATATTAGTCACTTCCAAGCACTGATGACGGCTATGGCTGCAACGATTGGTATGGGAAATATAGCAGG  
TGTCGCANCTGCTGTGACGATCGGTGGACCCGGTGCGATCTTCTGGATGTGGATTACCGCGTTGTTTGAATGGC  
CCAAA

**173.      *Bacillus thuringiensis* serovar *Kurstaki*****BTHUKUR****(SEQ ID NO. 173)**

GAGGAAACAGAGCACCGAAGGAGCAAATCCGCTTATATTAGCGGATAATCTCTCAGGTAAAAGGACAGAGACAAG  
CGAAAGAAAACGCCGATTTGTATCGGTTTATTTTTCTATTCCCTTGTTTCTCCAGAGACCATTTCATTTATGTGAA  
GTGGTTTTTTATTTTTTCTAAAAGGAGAATAAAGATGGAGACAGTAAGTAAAGTATTAGAACAAATCAATCACTA  
CGTATGGGGATTACCGACCTTATTCCCTTCTAATCGGAACTGGAATCATTCTCACAGTGCGCCTAAAAGGTTTACA  
GTTTAGTAGACTATTATACGCTCACAACTAGCATTTGCAAAATCAGAAGACACATCTTCTTTGGGAGATATTAG  
TCATTTCCAAGCACTCATGACAGCAATGGCCGCAACTATTGGGATGGGAAATATAGCCGGTGTGCAACAGCTGT  
TACAATCGGTGGGCCAGGGGCAATATTTTGGATGTGGATCACTGCCTTGTTTGAATGGCCCCAAA

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**174. *Enterococcus faecium* (SEQ ID NO. 174) FCM**

GACGGAATTCTGGAGAGACCTTATTAGGCGCCGAAGGGGCAAGGCATACTGCTCAATCTCTCAGGCAAAAGGACA  
GAAGGTAGAATACAAACACCATTAAGAACAGTCTTAGTCTTTTTTGTGTTTGCTGTTTTATCATTGCTTCAGAAG  
TTGTCTCAAAGAAAGAGATAGCTTTTTTCTTTTGGCGTCTTCGATGACTTTTAGGAGAGAAAGATGATAGCACTC  
GTTAAATTAATTGATAACCTTGTTTGGGGACCGCCCTCTTAATTTTATTGGTTGGGACGGGGATTTACCTTACC  
AGTCATTTAGGATTAATTCAAATCTTAAACTACCAAGAGCCTTTAAACTCATTTTTTTCAGATGACGAAGGACAT  
GGAGATATTTTCATCCTTTGCTGCTCTTGCAACTGCCCTTGCCGCTACTGTGCGAACTGGTAACATTGTTGGGGTT  
GCCACTGCTATCAAGTCTGGTAGTCTGGAGCGCTCTTTTGGATGTGGGTTGCCGCTTTTTTTTGAATGGCAACA  
AAATACGC

**175. *Enterococcus casseliflavus* (SEQ ID NO. 175) ECAS**

GNACCGGAATTCTGAGAGACCTTATTAGGGCGCCGAAGGGGCAAGGCATACTGCTCAATCTCTCAGGCNAAAGG  
NCAGAAGGTAAAATACAAACACCATTAAGAACAGTCTTAGTCTTTTTTGTGTTTGCTGTTTTATCATTGCTTCAG  
AAGTTGTCTCAAAGAAAGAGATAGCTTTTTTCTTTTGGCGTCTTCGATGACTTTTAGGAGAGAAAGATGATAGCA  
CTCGTTAAATTAATTGATAACCTTGTTTGGGGACCGCCCTCTTAATTTTATTGGTTGGGACGGGGATTTACCTT  
ACCAGTCATTTAGGATTAATTCAAATCTTAAACTACCAAGAGCCTTTAAACTCATTTTTTTCAGATGACGAAGGA  
CATGGAGATATTTTCATCCTTTGCTGCTCTTGCAACTGCCCTTGCCGCTACTGTGCGAACTGGTAACATTGTTGGG  
GTTGCCACTGCTATCAAGTCTGGTGGTCCTGGAGCGCTCTTTTGGATGTGGGTTGCCGCTTTTTTTTGAATGGCC  
ACAAAATACGC

**176. *Enterococcus flavescens* (SEQ ID NO. 176) EFLA**

AGGCGCCGAAGGGGCAAGGCATACTGCTCAATCTCTCAGGCAAAAGGACAGAAGGTAAAATACAAACACCATTAA  
GAACAGTCTTAGTCTTTTTTGTGTTTGCTGTTTTATCATTGCTTCAGAAGTTGTCTCAAAGAAAGAGATAGCTTT  
TTTCTTTTGGCGTCTTCGATGACTTTTAGGAGAGAAAGATGATAGCACTCGTTAAATTAATTGATAACCTTGTTT  
GGGGACCGCCCTCTTAATTTTATTGGTTGGGACGGGGATTTACCTTACCAGTCATTTAGGATTAATTCAAATCT  
TAAACTACCAAGAGCCTTTAAACTCATTTTTTTCAGATGACGAAGGACATGGAGATATTTTCATCCTTTGCTGCTC  
TTGCAACTGCCCTTGCCGCTACTGTGCGAACTGGTAACATTGTTGGGGTTGCCACTGCTATCAAGTCTGGTGGTC  
CTGGAGCGCTCTTTTGGATGTGGGTTGCCGCTTTTTTTTGGTATGGCCACAAAATACGC

**177. *Enterococcus gallinarum* (SEQ ID NO. 177) EGAL**

GAACGGAATTCTGGAGAGACCGTAAAGGCACCGAAGGGGCAAGGCAGGTAAGTCTCAAACTCTCAGGTAAAAGG  
ACAGAGCTAGGATAGACCGCTTTTTTGGCATTATCTAAGCATTCAGAGTACATGTATCTTGCATGTACTCTTTC  
TTTTGGGGTTGAAAGATAGGAGAAGGACATGTTAGAATTGCTTAAAGCGCTTGATGCTTTTGCTTGGGGGCCTCC  
CCTCTTGATCTTATTGGTCGGAACGGGTATCTATTTGACCATCCGACTGGGCCTTTTGCAGGTTACTCGTCTCCC  
TAAGGCCCTTCAGTTGATCTTTACCAAGGACAAGGGGCACGGCGATGTGTGAGCTTTGCTGCTCTCTGTACGGC  
TCTAGCAGCCACAGTTGGTACGGGAAATATCATCGGGGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCT  
CTTTTGGATGTGGATGGCGGCCTTCTTTGGAATGGCAACTAAATACGC

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**178. *Enterococcus raffinosus* (SEQ ID NO. 178) ERAF**

GACGGAATTCTGGAGAGACCGTAAAGGCACCGAAGGGGCAAGGCAGGTAACCTGCTCAAACCTCTCAGGTAAAAGGA  
CAGAGCTAGGATAGACCGCTTTTTGGCATTTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTACTCTTTCT  
TTTGGGGTTGAAAGATAGGAGAAGGACATGTTAGAATTGCTTAAAGCGCTTGATGCTTTTGCTTGGGGGCCTCCC  
CTCTTGATCTTATTGGTCGGAACGGGTATCTATTTGACCATCCGACTGGGCCTTTTGCAAGGTTACTCGTCTCCCT  
AAGGCCTTTCAGTTGATCTTTACCAAGGACAAGGGGCACGGCGATGTGTCGAGCTTTGCTGCTCTCTGTACGGCT  
CTAGCAGCCACAGTTGGTACGGGAAATATCATCGGGGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCTC  
TTTTGGATGTGGATGGCGGCCTTCTTTGGAATGGCCACCAAAATACGC

**179. *Streptococcus mitis* (SEQ ID NO. 179) SMIT**

ATNTTAAGGCACCCAAGGGCAAGGTCAGGCAACTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCG  
CTTTTATAGCATTTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTGCTCTTTCTTTTGGGGTTGAAAAGATA  
GGAGAAGGAAATGTTAGAATTGCTTAAATCAATTGATGCTTTTGCTTGGGGTCCACCCCTCTTGATTCTATTGGT  
CGGGACAGGGATTTACCTAACTGCTCGTCTAGGCCTCTTGCAAGGTTTTCGCTTTGCCTAAGGCCTTTCAGCTTAT  
TTTTACTAAGGACAAGGGGCATGGCGATGTATCCAGCTTTGCGGCCTTGTGTACAGCCCTAGCAGCGACAGTTGG  
TACGGGAAATATTATCGGGGTGGCGACGGCTATCAAGGTCGGTGGCCCAGGAGCCCTCTTTTGATGTGGATGGC  
CGCTTTCTTTGGAATGGCCCAAATACCGC

**180. *Streptococcus canis* (SEQ ID NO. 180) SCAN**

NTAGTNCTTTTAAATGACACTAGTGACCTTTCGTTAGTATGTTTTTAAGGACTGAGTATTGTAATACTAACATGA  
AAGAACTAGACAGGCGCCGAAGGGCAAGGCTAGACACACAGCTAGCTCAAACCTCTCAGGCAAAAGGACAGAAGA  
TAAGAATCGATTAAACAGGTAAGGTGTATTATCTTTGTCAGTCTTCTTATCACTTTTCAGGAGTTATCACTACGAT  
AACTCCTTTTTTCTATTCTAACTGTCATCATAGGACGCTATGTTTTATTAGGAGACTTATTCGTATATGCTAAAC  
TTTTTTACAATGCTAGATGATATGGTCTGGGGTGCCCCACTGCTTATTCTGTGGTGGGAACAGGGATTTATTTA  
ACTGTTTCGGCTTGGCTTACTCCAGGTTTTAAATTAACCTAAAGCCTTTAAATTAATTTTCGCAGACGATAAAGGT  
CAAGGGGATATTTCTAGTTTTGCCGCTCTTGCTACTGCTCTTGCAAGCAACAGTAGGTACTGGTAACATCGTTGGT  
GTAGCAACAGCTATCAAAGCTGGTGGTCCTGGAGCCCTATTTTGATGTGGATTGCTGCTTTCTTTGGAATGG

**Figure 7: Molecular marker IV (putative GTP-binding factor plus 160 nt downstream this ORF) sequences amplified from Gram-positive bacteria (SEQ ID NOs 181-193)**

**181. *Listeria monocytogenes* (SEQ ID NO. 181)**

GTTAGAAAAAGGAAGTTCTATTGTAGCATCGCCAAAAATCCATCAAACCTTATTAGATAACTACCTGCCTTAAAG  
AAAGCGCTCAACATAAAAAAACTTGTTTTTCAGAAAATAAAAAATCGTGCCAAATCGGCTCAGCTATGCTATAATAG  
GTAAGTTGATTTAAACGAGACGATAGCGACGGAGGAAAATAAATCTATTTTCCTCTTTCTTTGGCTAATCTTCA  
CGATAAATGTTTGGATTTTTAATTTAGGAGGAAACAAGATTGAATTTAAGAAATGATATTCGTAATGTAGCAATT  
ATTGCCACGTTGACCATGGTAAACAACCTCTAGTAGACCAATTATTACGCCAGTCAGGCACATTCCGCGACAAT  
GAAACAGTTGCAGAACGCGCAATGGACAACAATGATTTAGAAAGAGAACGCGGTATTACAATTTTAGCGAAAAAT  
ACAGCGATTAAAGTATGAAGATACACGTGTAAACATCATGGATACACCTGGACACGCCGATTTCCGGTGGAGAAGTA  
GAACGTATCATGAAAATGGTTGATGGTGTCTTTTAGTAGTGGACGCGTATGAAGGTACGATGCCTCAAACACGT  
TTTGTACTAAAAAAGCACTAGAACAAAACCTAACTCCAATCGTAGTAGTAAACAAAATTGACCGTGACTTTTGCT  
CGCCCAGAAGAAGTTGTTGATGAAGTATTAGAATTATTCATCGAACTAGGCGCAAACGACGATCAATTAGAATTC  
CCAGTTGTTTATGCTTCTGCAATCAACGGAACCTTCAAGCTATGATTCCGATCCAGCAGAACAAAAAGAAACAATG  
AAACCACTTTTAGACACAATTATCGAACATATCCCGGCTCCAGTTGATAATAGCGACGAACCATTACAATTCCAA  
GTATCATTACTTGATTATAATGACTATGTTGGTCGTATCGGTATTGGCCGCGTATTCCGTGGAACAATGCACGTG  
GGACAAACAGTTGCTTTAATTAACTTGATGGCACAGTAAAACAATTCCGTGTAACGAAAATGTTCCGGTTTCTTC  
GGACTAAAACGTGACGAAATTAAGAAGCAAAAGCTGGTGATTTAGTAGCATTAGCAGGTATGGAAGACATCTTC  
GTTGGTGAAACAGTAACACCATTTGACCACCAAGAAGCACTTCCGTTATTACGTATTGATGAGCCAACCTTGCAA  
ATGACTTTTCGTAACAAATAACAGTCCTTTTCGCTGGTCGTGAAGGTAAACACGTAACAAGCCGTAAAAATTGAAGAA  
CGTTTACTTGCAGAGCTTCAAACGGACGTATCTTTACGCGTAGAGCCAACAGCTTCCCCTGACGCTTGGGTAGTT  
TCTGGTCGTGGTGAGCTTCATTTATCCATTTTGATCGAAACAATGCGTCGCGAAGGTTATGAATTACAAGTTTCT  
AAACCAGAAAGTAATCATCCGTGAAATTGATGGCGTGAAATGTGAACAGTAGAAGATGTTCAAATTGATACTCCA  
GAAGAATTCATGGGTTCCGTTATTGAATCTATCAGCCAACGTAAAGGCGAAATGAAAAACATGATTAACGATGGC  
AACGGACAAGTTCGTTTACAATTCATGGTTCCAGCTCGTGGCTTAATCGGTTATACAACCTGATTTCCCTTTCAATG  
ACTCGTGGTTATGGTATTATCAACCACACA

**182. *Listeria innocua* (SEQ ID NO. 182)**

ATAAAAAAACTCATTTTCAGAAAATAAAAAATAGTGCTAAATCCGCTTAGCTATGCTATAATAGGTAAGTTGATTT  
AAACGAGACGATAGCGACGGAGGAAAATAAATCTATTTTCCTCTTTCTTTTGGCTAATCTTCACGATAAATGTTT  
GGATTTTTAATTTAGGAGGAAACAAGATTGAATTTAAGAAACGATATTGTAATGTAGCAATTATTGCCACGTT  
GACCATGGTAAAACTACACTAGTAGACCAATTACTACGCCAATCAGGTACTTTCCGCGACAATGAAACAGTTGCA  
GAACGTGCAATGGACAACAATGATTTAGAAAGAGAACGCGGTATTACAATTTTAGCGAAAAATACAGCAATTAAG  
TATGAAGATACACGCGTAAACATCATGGATACACCTGGACACGCCGATTTTGGTGGAGAAGTAGAACGTATCATG  
AAAATGGTTGATGGTGTCTTTTAGTAGTGGACGCGTATGAAGGTACTATGCCTCAAACACGTTTTGTACTAAAA  
AAAGCACTAGAACAAAACCTAACTCCAATCGTAGTAGTAAACAAAATTGACCGTGACTTTGCTCGCCAGAAGAA  
GTTGTTGATGAAGTACTAGAATTATTCATCGAACTAGGTGCGAACGACGATCAATTAGAATTCAGTTGTTTAT  
GCTTCTGCAATTAACGGAACTTCAAGCTTTGAATCCGACCCAGCAGAACAAAAAGAAACAATGAAACCACTTTTA  
GACACTATTATTGAACATATTCAGCTCCAGTTGATAACAGCGACGAGCCATTACAATTCAGTTTCTTTACTT

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GATTATAATGACTATGTTGGTTCGTATTGGTATTGGCCGCGTTTTCCGTGGAACAATGCACGTAGGACAAACAGTT  
GCCTTAATTAACTAGACGGCACAGTAAAAACAATTCCGTGTAACGAAAAATGTTCCGGTTTCTTCGGACTAAAACGT  
GACGAAATTAAAGAAGCAAAAGCGGGTGACTIONTAGTAGCACTTGCAGGAATGGAAGACATCTTCGTCGGTGAAACA  
GTAACACCATTTGACCACCAAGAAGCACTTCCACTTTTACGTATTGATGAGCCAACCTTGCAAATGACTTTTGTA  
ACAAATAACAGTCCTTTTCGCAGGCCGTGAAGGTAAACACGTAACAAGCCGTAAAAATTGAAGAACGCTTACTTGCA  
GAACTTCAAACGGATGTATCTTTACGCGTTGAACCAACAGCTTCTCCAGACGCATGGGTAGTATCTGGTCGTGGT  
GAGCTTCACTTGTCTATCTTAATTGAAACGATGCGTCGTGAAGGTTATGAGTTACAAGTTTCTAAACCAGAAGTA  
ATCATCCGTGAAATCGATGGCGTGAAATGTGAACCAGTAGAAGACGTTCAAATTGATACTCCAGAAGAATTCATG  
GGTTCAGTTATTGAATCTATCAGCCAACGTAAAGGCGAAATGAAAAACATGATTAACGACGGCAATGGCCAAGTT  
CGTTTACAATTCATGGTTCCAGCTCGTGGATTAATCGGTTATACAACCTGATTTCCCTTCAATGACACGTGGTTAT  
GGTATTATCAACCATACATTTCGATAGCTACCAACCAATCCAAAAA

**183.      *Bacillus cereus* (SEQ ID NO. 183)**

TTACTTTACAAAAGTAAGAATACAACATATTTTTATTCTTGCTTTTATTTTAATTGCTATTGTATCCCCTTCG  
CTCTTATAATAGAGAAGGATTAAAAAGACATTAGGAGTTGGACATGTTGAAAAACGACAAGATTTACGTAATAT  
AGCAATTATTGCCCACGTTGACCATGGTAAAACAACACTTGTGACCAAGTTATTACGTCAAGCGGGGACTTTCCG  
TGCGAACGAACACGTTGAAGAACGCGCAATGGATTCAAATGATCTAGAAAGAGAACGCGGTATTACAATTTTAGC  
GAAAAATACAGCGATTCACTATGAAGATAAAAGAATTAACATTTTAGATACACCTGGTCACGCTGACTTCGGTGG  
AGAAGTAGAACGTATCATGAAATGGTTGATGGTGTCTTACTTGTGTTGATGCATATGAAGGTTGTATGCCACA  
AACACGATTTGTTTTAAAGAAAGCTCTTGAGCAAACTTAACCTCAATCGTAGTTGTAAACAAAATTGACCGTGA  
CTTCGCTCGTCCAGATGAAGTAGTTGATGAAGTAATCGACTTATTCATTGAGCTTGGTGCAAACGAAGATCAATT  
AGAGTTCCCAGTTGTATTTGCATCAGCAATGAACGGAACAGCAAGCTTAGATTCAAATCCAGCAAATCAAGAAGA  
GAATATGAAATCATTATTCGATACAATTATCGAACATATTCCAGCACCAATTGATAACAGCGAAGAGCCACTTCA  
ATTCCAAGTAGCACTTCTTGATTACAACGACTACGTTGGACGTATTGGAGTTGGTCGCGTATTCCGCGGTACAAT  
GAAGGTTGGACAACAAGTTGCTTTAATGAAAGTAGACGGAAGCGTGAAGCAATTCCGCGTAACGAAATTATTCGG  
TTACATGGGATTAAAACGTCAAGAAATTGAAGAAGCAAAAGCAGGGGACTTAGTAGCCGTTTCTGGTATGGAAGA  
CATTAAACGTAGGTGAAACAGTATGTCCAGTTGAACATCAAGATGCGTTACCATTATTACGTATTGATGAGCCAAC  
ACTACAAATGACGTTCCCTGTAAATAACAGCCCATTTGCAGGTCGTGAAGGTAAATACATTACATCTCGTAAAT  
TGAAGAGCGTCTTCGTTACAATTAGAAACAGATGTAAGTTTACGTGTAGATAATACAGATTCTCCTGATGCGTG  
GATCGTATCTGGACGTGGGGAACCTACATTTATCTATCTTAATTGAAAACATGCGTCGTGAAGGTTATGAATTACA  
AGTATCTAAGCCAGAAGTAATCATTAAGAAGTTGATGGCGTAAGATGTGAGCCTGTAGAGCGGTACAAATCGA  
TGTAACCTGAAGAATACACTGGTTCTATTAT

**184.      *Bacillus anthracis* (SEQ ID NO. 184)**

CTATATTTTATTCTTGATTTTATTTTAATTGCTATTGTATCCCCTTCGCTCTTATAATAGAGAAGGATTAAAAA  
GACATTAGGAGTTGGACATGTTGAAAAACGACAAGATTTACGTAATATAGCAATTATTGCCCACGTTGACCATG  
GTAAACAACACTTGTGACCAAGTTATTACGTCAAGCGGGGACTTTCCGTGCGAACGAACACGTTGAAGAACGCG  
CAATGGATTCAAATGATCTAGAAAGAGAACGCGGTATTACAATTTTAGCGAAAAATACTGCGATTCACTATGAAG  
ATAAAAGAATTAACATTTTAGATACACCAGGTCACGCTGACTTCGGTGGAGAAGTAGAACGTATTATGAAAATGG  
TTGATGGTGTATTACTTGTGTTGATGCATATGAAGGTTGTATGCCACAAACACGATTTGTTTTAAAGAAAGCTC

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TTGAGCAAACTTAACTCCAATCGTAGTTGTAAATAAAATTGACCGTGACTTCGCTCGTCCTGATGAAGTAGTTG  
ATGAAGTAATCGACTTATTCATCGAAGTTGGTGCAAACGAAGATCAATTAGAGTTCCCAGTTGTATTTGCATCAG  
CAATGAACGGAACAGCAAGCTTAGATTCAAACCCAGCAAATCAAGAAGAGAATATGAAATCATTATTTGATACAA  
TTATTGAACATATTCCTGCACCAATTGATAACAGCGAAGAGCCACTTCAATTCCAAGTAGCACTTCTTGATTACA  
ACGACTATGTTGGACGTATCGGGGTTGGACGCGTATTCCGCGGTACAATGAAGGTTGGACAACAAGTTGCTTTAA  
TGAAAGTAGACGGAAGTGTAACAATTCCGCGTAACGAACTATTTGGTTATATGGGATTAAAACGTCAAGAAA  
TTGAAGAAGCAAAAGCTGGAGACTTAGTAGCTGTTTCTGGTATGGAAGACATTAACGTAGGTGAAACAGTATGTC  
CAGTTGAACATCAAGATGCGTTACCATTATTACGTATTGATGAGCCAACACTACAAATGACATTCCTTGTAATA  
ACAGCCCATTTGCAGGTCGTGAAGGTAAATACATTACATCTCGTAAAATTGAAGAGCGTCTTCGTTTACAATTAG  
AAACAGATGTAAGTTTACGCGTAGATAATACAGAATCTCCTGATGCGTGGATCGTATCTGGACGTGGGGAACACTAC  
ATTTATCTATCTTAATCGAAAACATGCGTCGTGAAGGTTATGAACTACAAGTATCTAAACCAGAAGTAATCATTA  
AAGAAGTTGATGGCGTAAGATGTGAGCCTGTAGAGCGTGTGCAAATTGATGTACCTGAAGAATACACTGGTTCTA  
TTATGGAATCTATGGGTGCACGTAAAGGTGAAATGTTAGATATGGTGAATAACGGAAACGGTCAAGTTCGCCTTA  
CTTTCATGGTTCCAGCACGTGGTTTAATTGGTTACACAACAGAATTCTTAACATTAACCTCGTGGTTACGGTATTT  
TAAACCATACATTGATTGCTACCAACCAGTACACGCTGGACAAGTTGGTGGACGTCGTCAAGGTGTTCTAGTTT  
CACTTGAAACAGGAAAAGCATCACAATACGGTATTATGCAAGTTGAAGACCGTGGTGTAATCTTCGTTGAACCAG  
GTACAGAAGTATATGCTGGTATGA  
TTGTTG

**185.      *Staphylococcus aureus* (SEQ ID NO. 185)**

TCAATTATATGATATAATAAAAAAGTTGTAATTAAAAGTGGGATTTTACTTAAGAAAGAAGGAACTATTTATAT  
GACTAATAAAAAGAGAAGATGTCCGCAATATAGCAATTATTGCTCACGTTGACCATGGTAAAACAACCTTAGTAGA  
TGAGTTGTTAAAACAATCTGGTATATTAGAGAAAATGAACATGTCGATGAACGTGCAATGGACTCTAACGATAT  
CGAAAAGAGAGCGTGGAATTACGATTCTAGCCAAAAATACGGCTGTTGATTATAAAGGTACACGTATTAATATTTT  
GGATACACCAGGACATGCAGACTTTGGTGGAGAAGTAGAACGTATTATGAAAATGGTTGATGGGGTTGTCTTAGT  
AGTAGATGCGTATGAAGGTACAATGCCTCAAACACGTTTGTACTTAAAAAAGCGCTAGAACAAAACCTGAAACC  
TGTTGTTGTTGTTAATAAAATTGATAAACCATCAGCACGTCCAGAGGGTGTTGTAGATGAAGTTTTAGATTTATT  
TATTGAATTAGAAGCAAACGATGAACAATTAGAATCCCTGTTGTTTATGCTTCAGCAGTAAATGGAACAGCTAG  
CTTAGATCCTGAAAACAAGATGATAATTTACAATCATTATATGAAACAATTATTGATTATGTACCAGCTCCAAT  
TGATAACAGTGATGAGCCATTACAATTCCAAGTAGCATTGTTGGACTACAATGATTATGTTGGACGTATTGGTAT  
TGGTCGTGTATTAGAGGTAAAATGCGTGTGCGAGATAATGTATCACTAATTAAATTAGACGGTACAGTGAAAAA  
CTTCCGTGTAACATAAAATCTTTGGTTACTTTGGATTAAAACGTTTAGAAATTGAAGAAGCACAAAGCTGGAGATTT  
AATTGCTGTTTCAGGTATGGAAGACATTAATGTTGGTGAACTGTAACACCACATGACCATCAAGAAGCATTGCC  
AGTTCTACGTATTGATGAGCCTACTCTTGAAATGACATTTAAAGTTAACAATTCTCCATTTGCTGGCCGTGAAGG  
TGACTTTGTAACAGCACGTCAAATTCAAGAAGTTTAAATCAACAATTAGAAACAGATGTATCTTTGAAAGTTTC  
TAACACAGATTCTCCAGATACATGGGTAGTTGCTGGTCGCGGTGAATTGCATTTATCAATCCTTATTGAAAATAT  
GCGTCGTGAAGGTTATGAATTACAAGTTTCAAACACACAAGTAATTATTAAAGAAATAGATGGTGTAATG

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**186.      *Staphylococcus epidermidis* (SEQ ID NO. 186)**

ACCCACCTTTTACTTATCTTTTCAATAATATATGATATAATAAACAGTTGCAATTAAAAGTGGGAGTATACAC  
AAGAAAGGAATTTATAAAATGACTAATTTAAGAGAAGATGTTTCGTAATATAGCGATTATTGCGCATGTCGACCAT  
GGTAAACAACATTAGTAGACCAGTTGCTTAAACAATCAGGTATATTTTCGTGAAAACGAACATGTCGACGAGCGT  
GCAATGGACTCTAATGATTTAGAAAGAGAACGTGGTATTACGATTCTTGCTAAGAATACAGCGATAGATTATAAA  
GGAACGCGTATCAATATATTAGACACACCTGGCCACGCCGATTTTGGTGGTGAAGTTGAACGTATCATGAAAATG  
GTTGACGGTGTCTACTAGTGGTTGACGCATATGAAGGTACAATGCCTCAAACCTCGTTTTGTTCTTAAAAAAGCT  
TTAGAACAAAACCTTAAAACCGTTGTAGTTGTGAATAAAATTGATAAACAGCTGCTAGACCTGAGGGAGTTGTA  
GATGAAGTATTAGACTTATTCATTGAATTGGAAGCGAATGATGAGCAATTAGACTTCCCAGTTGTTTATGCTTCA  
GCTGTGAATGGAACAGCAAGTTTAGACTCTGAAAAGCAAGACGAAAATATGCAATCCCTATACGAGACGATTATT  
GACTATGTACCGGCACCAGTAGATAATTCAGATGAACCATTACAATTCCAAATTGCTTTACTAGATTATAATGAT  
TATGTAGGTCTGATAGGCGTTGGACGTGTGTTTACAGAGTAAAATGCGTGTAGGTGATAATGTATCACTAATTAAA  
TTAGATGGTACAGTTAAGAACCTTTCGTGTGACGAAAATATTTGGTTACTTTGGTCTTAAACGTGAAGAAAATTGAA  
GAAGCACAAGCAGGAGACTTAATAGCTGTTTCAGGTATGGAAGATATTAACGTTGGTGAACAGTTACACCACAT  
GATCATCGTGACCCATTACCGGTGTACGTATTGATGAACCAACCCTAGAAATGACTTTTAAAGTAAATAACTCT  
CCGTTTGCTGGACGTGAAGGTGATTATGTAACAGCTCGACAAATTCAGAAAGATTAGATCAACAACCTTGAAACA  
GATGTTTCTTTAAAAGTTACACCTACTGATCAACCAGATTTCATGGGTTGTTGCTGGTCTGTGGTGAACCTACACTTG  
TCTATTCTTATTGAAAACATGAGACGTGAAGGCTTTGAATTACAGGTTTCTAAACCTCAAGTTATTTTAAAGAGAA  
ATCGATGGTGTGTTAAGTGAACCATTTGAGCGTGTACAATGTGAA

**187.      *Bacillus subtilis* (SEQ ID NO. 187)**

GAAAAACGTGACGCTTTTAAAGAGGATGTGTGATATAATATGAAAGTTATCTAATTTTTTTTAGGAGATGAAAAAG  
TGAAACTTCGAAATGATCTTCGCAACATCGCGATTATTGCCACGTTGACCATGGGAAAACGACTCTAGTCGATC  
AGCTTTTACATCAGGCTGGTACGTTCGTCGCAACGAACAGGTTGCTGAACGCGCAATGGACTCTAATGATCTTG  
AACGCGAACGCGGCATTACAATATTGGCGAAAATACTGCGATTAACCTATAAAGATACACGTATCAATATTTTGG  
ACACCCCTGGACATGCAGACTTTGGGGGAGAAGTAGAACGGATTATGAAAATGGTTGACGGCGTAGTGCTTGTCG  
TTGACGCATATGAAGGCTGTATGCCTCAAACCTCGTTTTGTTCTGAAAAAAGCTCTTGAGCAAAACCTGAACCTG  
TTGTTGTTGTAAACAAAATTGACCGTGACTTTGCTCGTCAGAGGAAGTTATCGATGAAGTTCTGGATCTGTTCA  
TTGAGCTTGATGCCAATGAAGAGCAGCTCGAGTTCCAGTGATATGCTTCCGCGATTAATGGAACAGCGAGTC  
TTGATCCGAAACAACAGGATGAAAACATGGAAGCTTTATATGAAACCATTATTAAGCATGTTCCGGCACCTGTTG  
ATAATGCAGAGGAGCCGCTTCAATTCCAAGTTGCCCTTCTTGACTACAACGACTATGTAGGCCGTATCGGAATCG  
GACGCGTATTCCGCGGCACAATGAAAGTCGGACAGCAGGTTTCTCTTATGAAGCTTGACGGAACGGCAAAGTCAT  
TCCGTGTTACAAAGATTTTTGGTTTCCAAGGCTTAAAGCGTGTGGAAATTGAAGAAGCAAAAGCGGGAGACCTCG  
TTGCGGTTTCCGGGATGGAAGATATCAACGTTGGTGAACGGTATGTCCTGTAGACCATCAAGATCCGCTTCCGG  
TCCTTCGCATTGATGAGCCGACACTTCAAATGACATTTGTCTGAATAACAGTCCGTTTGCAGGCCGTGAAGGCA  
AATATGTAACGGCCCGCAAATCGAAGAGCGTCTTCAATCACAGCTTCAGACGGATGTGAGCTTGCGTGTTGAGC  
CAACAGCTTCTCCTGATGCTTGGGTTGTTTTCAGGACGCGGTGAGCTGCACTTGTCAATTTTAAATTGAAAATATGC  
GTCGTGAGGGCTATGAGCTTCAAGTGTCAAACCTGAAGTTATTATCAAAGAAATCGACGGCGTACGCTGTGAGC  
CTGTTGAACGTGTGCAAATTGATGTTTCTGAAGAGCATACTGGCT



**188. *Streptococcus mutans* (SEQ ID NO. 188)**

GGAATGGAAAAGTAAAAGAGAAGAATTAGTTCTTTTTTTGAGATAATGACAGGGATTAGTATGAGCTGTTGTCTTT  
TGTTTTTGC AATACTGGTTGATTGAGGACTTATTTTATAAAATTTGGAGATACCAAGACTGCGACTTTGCTATCT  
TGGTTTTTCTTTTATATTTTAAACATTTACATATCTCTCCTGAGTTTTTCCCTAATTTTTATGGTATAATAGAT  
AAGTTGAAATAAATTAATGTAAATGTAAGAGGAATTATGACAAATTTTAGAGAAGATATTAGAAATGTTGCTAT  
CATTGCCACGTTGACCATGGGAAAACAACCTTGTTGATGAGCTCTTAAAACAATCGCATACACTTGATGAGCA  
TAAAAAATTAGAAGAACGTGCGATGGACTCTAATGATCTTGAAAAAGAGCGTGGGATTACTATTCTTGCAAAAAA  
TACTGCTGTTGCCTACAATGGTGTACGTATTAACATTATGGACACACCAGGACATGCGGATTTTGGTGGAGAAGT  
AGAGCGTATCATGAAAATGGTTGATGGGGTTGTTCTTGTTGTTGATGCTTATGAAGGTACCATGCCGCAAACACG  
TTTTGTTTTGAAAAAGCTTTGGAACAAAACCTGGTTCCAATCGTGGTGGTGAATAAGATTGACAAGCCATCAGC  
TCGTCCGGCAGAAGTTGTTGATGAAGTTCTTGAACTTTTTCATTGAACCTGGAGCAGATGATGACCAGTTAGAGTT  
TCCAGTCGTTTACGCTTCGGCGATTAATGGAACCTCTTCATTATCAGATGAACCAGCGGATCAAGAACATACAAT  
GGCACCCTGTTTTGATACTATTATTGAGCATATTCCAGCACCGATCGATAATTCAGATCAGCCACTTCAATTTCA  
AGTGTCTCTCCTTGATTATAACGACTTTGTTGGACGTATCGGTATTGGGCGAGTCTTCCGTGGTTCGTGTTAAAGT  
CGGGGATCAAGTGACACTTTCTAACTTGATGGTACAACAAAGAATTTTCGTGTTACAAAACTTTTCGGTTTCTT  
CGGTTTGAACGTCGTGAGATTAAGGAAGCTAAGGCTGGCGATTTGATTGCTGTTTCAGGTATGGAAGATATCTT  
TGTTGGTGAACGATTACACCAACTGATGCTGTAGAACCCTTCCTATTCTTCACATTGATGAGCCAACCTCTGCA  
AATGACCTTTTTAGCTAACAATTCCCCTTTTGAGGCCGTGAAGGTAAATTTGTAACCTCGCGTAAGGTAGAAGA  
GCGTTTGTGGCAGAATTGCAAACAGATGTTTCCCTTCGTGTAGAAGCCACTGACTCACCAGATAAATGGACGGT  
TTCAGGTCGTGGGGAGTTACATCTGTCAATCCTTATTGAAACCATGCGCCGTGAAGGATATGAGCTGCAAGTATC  
GCGTCCAGAAGTTATTATCAAAGAAATTGATGGCATCAAATGTGAGCCATTTGAACGCGTGCAAATTGACACACC  
GGAAGAATACCAAGGTGCTGTTATCCAGTCCCTTTCAGAACGTAAAGGTGAAATGCTTGA

**189. *Streptococcus pneumoniae* (SEQ ID NO. 189)**

AAGCGGAGTGAAAACATTTACACTTGCTTGAGTTATGTTATTTATTTGAAATTATGGTATAATCGTTCAGTTAGA  
AAATAAATTTTGAATATTATAGAGGAAATCATGACAAAATTAAGAGAAGATATCCGTAACATTGCGATTATCGCC  
CACGTTGACCACGGTAAAACAACCTGGTTGACGAATTATTGAAACAATCAGAAACGCTTGATGCACGTACTGAA  
TTGGCAGAGCGTGCTATGGACTCAAACGATATCGAAAAAGAGCGTGGAATCACCATCCTTGCTAAAAAATCTGCC  
GTTGCTTACAACGGAACCTCGTATCAACATTATGGACACACCAGGACACGCGGACTTCGGTGGAGAAGTTGAGCGT  
ATCATGAAAATGGTTGACGGTGTGTCTTGCTGCTAGATGCCTATGAAGGAACCATGCCACAAACTCGTTTCGTA  
TTGAAAAAAGCCTTGGAACAAGACCTTGTCCTAATCGTGGTTGTTAACAAAATCGATAAGCCATCAGCTCGTCCA  
GCAGAAGTAGTGGATGAAGTCTTGGAACTTTTTCATCGAGCTTGGTGCAGATGACGACCAGCTTGATTTCCAGTG  
GTTTATGCTTCAGCGATCAACGGAACCTCTTCATTGTCAGATGATCCAGCTGACCAAGAAGCGACTATGGCACCA  
ATCTTTGACACGATTATCGACCATATCCAGCTCCAGTAGATAACTCAGATGAGCCTTTGCAGTTCCAAGTGTC  
CTTTTGGACTACAATGACTTCGTTGGACGTATCGGTATCGGTGCTTCCGTGGTACAGTTAAGGTTGGGGAC  
CAAGTTACCCTTTCTAACTTGACGGTACAATAAAACTTCCGTGTTACAAAACCTCTCGGTTTCTTTGGTTTG  
GAACGTCGTGAAATCCAAGAAGCCAAAGCGGGTGAAGTTGATTGCCGTTTCAGGTATGGAAGACATCTTTGTCGGT  
GAAACCATCACTCCGACAGATGCAGTAGAAGCTCTTCCAATCCTACACATCGATGAGCCAACCTCTTCAAATGACT  
TTCTTGGTCAACAACCTCACCATTGCTGGTAAAGAAGGTAAATGGGTAACTTCTCGTAAGGTGGAAGAAGCGTTG

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CAGGCAGAATTGCAAACAGACGTTTCCCTTCGTGTTGACCCAACTGATTCACCAGATAAATGGACTGTTTCAGGA  
CGTGGAGAATTGCACTTGTCAATCCTTATCGAAACAATGCGTCGTGAGGGCTATGAACT

**190.      *Streptococcus agalactiae* (SEQ ID NO. 190)**

AGAAATGAATTAAATTGAAAAAGTAGAAAATAAATGGCATAAATAATGAAATGATGAAAAGTTTTCTTATCACA  
AATAGGCAGTTAATATGAAAACATTTACACTTGTGTAAATTCTGTTTTTTAAGAAAAATTGTGTTATAATTTCATA  
AGTTAACAGAATTACATTATAAAATAGAGGAAAACATGACAAATTTAAGAACAGATATCCGTAACGTTGCGATCA  
TTGCCACGTTGACCACGGTAAAACAACCTCTCGTTGATGAATTATTAAAACAATCACATACTCTTGATGAGCGTA  
AAGAGCTTGAAGAACGTGCAATGGATTCAAATGATATCGAAAAAGAACGTGGTATCACCATTCTTGCAAAAAATA  
CAGCCGTAGCATACAACGATGTTTCGTATCAATATTATGGACACACCTGGTCACGCGGACTTTGGTGGTGAAGTTG  
AGCGTATTATGAAAATGGTTGATGGTGTGTTTTAGTCGTTGATGCCTACGAAGGAACAATGCCACAAACACGTT  
TTGTTTTGAAGAAAGCTCTTGAACAAAACCTTAATTCCAATCGTTGTTGTAAATAAAATTGATAAGCCGTCAGCTC  
GTCCATCAGAGGTTGTTGATGAAGTTCTTGAACATTTTATTGAGCTCGGTGCTGATGATGATCAACTAGATTTCC  
CTGTTGTTTATGCTTCAGCTATCAATGGAACATCTTCAATGTCAGATGATCCTTCAGATCAAGAAAAACAATGG  
CACCGATTTTGTACTATCATTGATCACATTCCAGCCCCAGTTGACAACCTCGGAAGAACCACTTCAATTCCAAG  
TTTCTCTTCTTGATTACAATGATTTTGTAGGACGTATTGGTATTGGACGTGTTTTCCGCGGGACTGTCAAAGTTG  
GAGATCAAGTTACTCTTTCAAACCTTGATGGTACAACATAAACTTCCGCGTAACAAAACCTTTTTGGTTTCTTTG  
GACTTGAACGTAAAGAAATCCAAGAGGCTAAAGCGGGTGATTTAATCGCTGTTTCTGGTATGGAAGATATCTTCG  
TTGGTGAGACAGTAACTCCGACAGATGCTATTGAACCACTACCAGTTTTACGTATTGACGAGCCAACACTTCAAA  
TGACTTTCTTGGTGAATAATTCACCATTTGCAGGTCGCGAAGGTAAATGGATTACGTCACGTAAAGGTTGAAGAAC  
GTCTTTTAGCAGAATTACAAACAGACGTTTCTTTACGTGTTGACCCAACAGATTCGCCAGATAAATGGACGGTTT  
CAGGGCGTGGAGAATTACATTTATCTATCCTTATTGAAACAATGCGTCGTGAGGGATATGAACTTCAAGTATCAC  
GTCCAGAAGTTATCATCAAAGAAATTGATGGTGTTCATGCGAGCCGTTTGAGCGTGTTCAAATTGATACTCCAG  
AAGAATATCAGGGTGCTATTATCCAAAGTTTGTGAGAGCGTAAAGGTGATATGCTTGATATGCAGATGGTTGGTA  
ATGGTCAAACGCGTTTGATTTTCTTGATTCTGACGTGGTTTGATTGGTTATTCAACAGAGTTTCTTTCAATGA  
CACGTGGATATGGTATCATGAATCATACTTTTGACCAGTATCTACCGTTGTTCAAGGAGAAATTGGTGGTCGTC  
ATCGTGGTGCTTGGTTTCTATTGAAAATGGTAAAGCAACTACATATTCAATTATGCGTATTGAAGAACGTGGGA  
CTATCTTTGTAAATCCAGGTATAGAAGTTTATGAAGGAATGATTGTTGGTGAGAATTCTCGTGATAATGACCTCG  
GAGTCAATATTACAACCTGCTAAACAAATGACAAATGTCCGTTTCAGCAACTAAAGATCAAA

**191.      *Streptococcus pyogenes* (SEQ ID NO. 191)**

GTCTTAAAAGACGGTATTGATTATTGGGATGGCAAAGTTAAACAAACAACCTAGTTAAGAGTAACGTGGAGTTAA  
GGGAATAAAGGCAGTCACTGTCTCAAAAACCTTAATTCCTTTTTTTGCTGTATCCAGACTTGCTGAAAGTCTGA  
AAATATTTACAATTGATTAAAACAGTTTTTTTAAACATTTTGTGTTATACTTATCTAGTTAAATATATTTACT  
TAGAGGAACAAATGACTAACTTAAGAAACGATATCCGTAACGTAGCGATTATTGCCACGTTGACCACGGAAAAA  
CAACACTTGTAGATGAATTATTAAAACAATCCCATACTCTTGATGAGCGTAAAGAGCTTCAAGAGCGTGCCATGG  
ATCCAATGACCTTGAAAAAGAACGTGGGATTACAATCCTTGCGAAAAATACGGCAGTAGCCTATAACGATGTTT  
GTATTAACATCATGGATACCCAGGACACGCGGACTTCGGTGGTGAAGTTGAACGTATCATGAAAATGGTTGACG  
GGGTTGTTCTTGTGTGGATGCCTACGAAGGAACAATGCCCCAGACGCGTTTCGTATTGAAAAAGCACTTGAGC  
AAAACCTTATCCCGATCGTTGTGGTGAACAAGATTGACAAACCTTCAGCTCGTCCAGCAGAAGTTGTAGATGAAG

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TGCTTGAATTATTCATCGAACTTGGTGCCGATGATGAGCAATTGGAATCCCAGTTGTTTACGCATCAGCTATTA  
ATGGAACATCATCATTATCAGATGACCCTGCTGACCAAGAGCATACTATGGCACCGATCTTTGATACGATTATTG  
ATCATATTCCAGCGCCAGTTGATAATTCAGATGAGCCTTTGCAATCCAAGTGTCACTTTTGGACTACAACGATT  
TCGTAGGTTCGTATCGGTATCGGTTCGTGTTTTCCGTGGTACTGTTAAAGTGGGTGACCAAGTAACCTTTCAAAC  
TTGATGGTACCACTAAAACTTCCGTGTTACAAAAGTGTGGTTTCTTCGGTTTGGAACGTCGTGAAATTCAAG  
AAGCTAAAGCAGGTGACTTGATTGCTGTTTCAGGTATGGAAGATATCTTTGTTGGAGAAACCATTACACCAACTG  
ACTGTGTGGAAGCTCTGCCAATTCTTCGTATTGATGAGCCAACACTTCAGATGACTTTCTTGGTCAATAACTCTC  
CTTTTGCAGGTTCGTGAAGGTAAATGGATCACGTACGTAAGGTTGAAGAAGCTCTTTTAGCAGAATTGCAAACAG  
ACGTGTCACTTCGTGTTGACCAACAGATTGCCAGATAAATGGACGGTTTCAGGGCGTGGAGAATTGCATTTAT  
CTATCCTCATTGAAACCATGCGCCGTGAAGGCTATGAACTTCAAGTATCACGTCCAGAAGTTATCATCAAAGAAA  
TTGATGGTGTCAAATGTGAACCGTTTGAGCGTGTCAAATTGATACACCAGAAGAATATCAGGGTGCAATCATCC

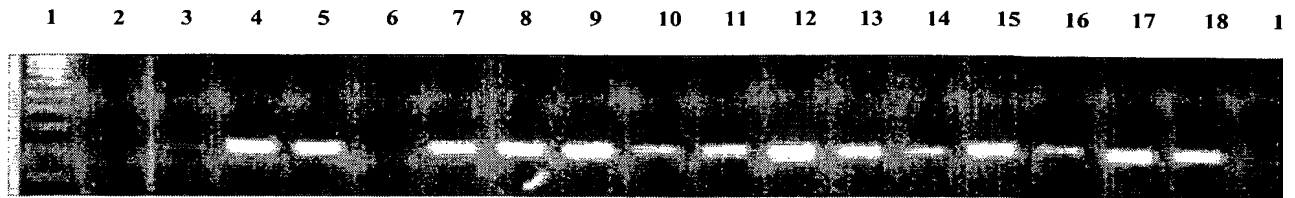
**192.      *Enterococcus faecalis* (SEQ ID NO. 192)**

CATCACGCAACGGAAATCGGACAAGCAAGCATGGGCGTGCCTATTAGCGGTTGTGCAGGTTTGGAATTATTGCT  
ATGTTAAAAGGCAACCATCATGGCTATTTATCTAATCTAAGTCCTTGGGATTATGCAGCAGGCTTAGTACTTTTG  
GAAGAATTTGGGTTTAAATACTCTGGTATTACAGGAAAACCATTAACTTTTGCGGGTCGTGAATACTTTATTGCA  
GCAACTCCTGAAACCTATGATGAAGTATTTACCCGATATTTAAATGAATCGGAATAATCAAAGAAGAGCGTTGCT  
GAAAGGTAAGGCTCTTCCTCTTTTAAAAGAGAAAAATTTGTAAAAAATGTCCTTGTTTTTCAGAAAAAGCCGAAT  
AATTTCTAAAACCTTTCATTATTTTTGCAGGCGAAAGCCTTTTTTTAATGAAAAAGTTTGCTATAATAAGCAGTC  
GGCTTTTATGGACTTAAGTAACATAAGCGTATATAGATAAGGAGCAATTAAATTGAAATACAGAGATGATATTGCG  
TAACGTGGCAATTATCGCCACGTTGACCATGGTAAAACAACCTTAGTAGATGAACTTTTAAAACAATCTGACAC  
TTTAGATGGACACACACAATTACAAGAACGTGCAATGGATTCCAATGCACCTTGAAAGTGAACGTGGAATTACTAT  
CTTAGCAAAAAATACAGCCGTAGATTATAACGGTACACGTATCAACATTCTAGATACACCAGGACACGCGGACTT  
CGGTGGTGAAGTAGAACGTATCATGAAATGGTAGACGGTGTGTTTTAGTTGTGCGATGCGTATGAAGGAACAAT  
GCCTCAAACACGTTTCGTATTGAAAAAGCATTAGAACAAAAAGTAACACCAATCGTGGTTGTTAACAAAATTGA  
CAAACCTTCTGCTCGTCCTGAACACGTAGTAGATGAAGTTTTAGAGTTATTCATCGAATTAGGTGCAGACGACGA  
TCAATTAGATTTCCAGTTGTTTATGCTTCTGCTTTAAACGGAACTTCAAGTGAATCAGATGATCCAGCAGATCA  
AGAGCCAACAATGGCCCCAATTTTTGATAAAATTATTGAACATGTGCCAGCTCCAGTTGACAATTCAGACGAACC  
ACTTCAATTCOAAGTCTCATTACTAGACTACAACGATTACGTTGGACGTATTGGGATTGGCCGTGTGTTCCGTGG  
CACAATGAAAGTCGGCGACCAAGTTGCGTTGATGAAATTAGATGGCAGCGTGAAAAATTTCCGTGTAACGAAAAAT  
TTTAGGTTTCTTTGGCTTACAACGTGTGGAATTTGATGAAGCAAAAGCGGGCGATTTAATTGCCGTTTCTGGAAT  
GGAAGACATTTTCGTGGGGAAACAGTTGTAGATGTTACAATCAAGAAGCATTACCAATTCTACACATTGATGA  
GCCAACCTTACAAATGACTTTCTTAGTTAACAATTCTCCATTTGCGGGACGTGAAGGAAAATACATCACCGCTCG  
TAAATCGAAGAACGTTTAAATGGCTGAGTTACAAACAGACGTATCTTTACGTGTTGATCCAATTGGCCCAGATTC  
TTGGACTGTATCAGGTTCGTGGCGAATTGCATTTATCAATTTTAAATTGAAAACATGCGTCGTGAAGGCTATGAATT  
ACAAGTTTCTCGTCCAGAAGTTATTGAACGTGAAATTGATGGAGTTAAATGTGAACCATTTGAACGTGTTCAAAT  
TGACACACCTGAAGA

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**193.      *Lactococcus lactis* (SEQ ID NO. 193)**

CGAAAAAGCAAGTTAAATATGTTGTAAATAATGGTGTTACATTAGATAAATACTAGTGGTGGGCCTAATTTGGCTG  
CACCTGTGACGGTGGATAGTCAGGTAATTTGGAACGATAAAGGTACGATTATGGGTGTAAGGACCTATACAGCAG  
ATTTAAGCCAAGCAGAAGTAGTTAAAAAAGTGGGTAATTTGAATGCAATGTCCTTTGGAGAATTTTGGGGTACAA  
AAGTTTTTGTGCCAGCCAAAATCAGACAAATTCAGATAAGACTTATTCTGTTACGTTTAAACTGAATATAAATT  
GGATAGTATCTAATGGCTATGCTTCGCTAACAAAAGTAACAGGTGGCTATGGTTCTTGCATTGACCATGTTTATG  
TTGCTAATTCTAGTGTTACTACTGCAACGAATGGTCAGATTAAAGGTTCAAGTGGTTATACTCAACAAGTTGATG  
ACAAATCAGAAGGGAATAGTTTATCGTGGTCAATTACGCGAACTATAAACCTGTAAAAGTTCCAGCAAGTGGGG  
CAAATGTAGGAGCTACGTATTTTGCCACACTTAAACGGGGAAATAGTACATGGAAATTCAAAACAACAAATAGAG  
CTTATTAAGTGGGAGGAAGTGAATGAATATAAAAGGCATAAAAATTTGGCAAGTATTTCTTGCAATTCATCATTT  
GGATAGGAACCATGTTTCTTCCCTGCAACGGTAAATCAGGCTAAATTGAATACGAATTTTGACTATAAAAAAAGTC  
GAGAAAATTTCTTTTATTTTCTTTTTCATCAAGTCCCTTTTTATAGTTTCATTTTGGGATTGGTGTGCTTATAT  
CACTTTTTCTCATTTATAGGAAAATAAATTTTAGTGTCTATTTTCTTTTGCTAGTCTTATTTTTTACATTAGTT  
TCTTAGTTATAGCTTTTCCGTCTATGATTATTTTAAATCATAGTTTATCTGGGAATACTTTTGGGGCTGAACTTT  
CTATCTTTCTAACCTTTTATGGAGCTGGATATATTATTGCTGTTCTATTTGGTTTAGTTGCTTTTCTTTTACTCT  
TTCTCTACAGTTTAAGAATAAAAGAATGTTAACAACATAATCATTTTTACTGATTTTATTAATTATAAAAAAATA  
AAGAACTCCTTAGAAATTTTCTTTGGGGTTTTTCATTTTGGAAGTAAAAAATCTTTGTTAGGCTTGTAACGTG  
TGCATTTACAGCTTTTAGAAAAGTGTGCTATAATGGGTAGATATATACGAAAGTAAGGTATGATAAAATTGACT  
AAATTACGCGAAGATATTAGAAACGTCGCTGTTATTGCCCACGTTGACCATGGTAAACTACATTGGTTGACGAA  
CTCTTAAACAATCTCAAACGTTGGATGCTCGTAAAGAATTAGCTGAACGTGCGATGGACTCAAATGCACTTGAG  
CAAGAACGTGGGATTACTATCCTTGCCAAAAATACAGCAGTTGAATATAACGGAACCTCGTATCAACATCTTGGAC  
ACACCAGGTCACGCGGACTTCGGTGGAGAAGTTGAACGTATTATGAAAATGGTTGATGGGGTTGTCCCTCGTTGTC  
GATGCTTATGAAGGAACAATGCCTCAAACACGTTTTGTTTTGAAA

**Figure 8. Amplification of molecular marker V (carB) in Gram-negative bacteria**

1. DNA Ladder (123 bp)
2. *Pseudomonas aeruginosa*
3. *Pseudomonas pseudoalcaligenes*
4. *Stenotrophomonas maltophilia*
5. *Citrobacter freundii*
6. *Serratia liquefaciens*
7. *Providencia stuartii*
8. *Klebsiella pneumoniae*
9. *Klebsiella oxytoca*
10. *Pseudomonas syringae*
11. *Pseudomonas putida*
12. *Enterobacter aerogenes*
13. *Pseudomonas diminuta*
14. *Proteus mirabilis*
15. *Burkholderia cepacia*
16. *Burkholderia pickettii*
17. *Proteus vulgaris*
18. *Serratia marcescens*
19. Negative control

**Figure 9. Molecular marker V (carB) sequences amplified from different Gram-negative bacteria (SEQ ID NOs 194-232, 238-239, 242-254) and from various Gram-positive bacteria (SEQ ID NOs 233-237, 240-241, 255)**

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AGAAATCTGCGAACGCGGCCTGGATCTCTCTCCGACCAACGAAGTCTGATCGATGAATCGCTGATCGGCTGGAA  
AGA

**198. *Shigella sonnei* (SEQ ID NO. 198)****SSON**

GCGACCTACATCGAGCCGATTCACTGGGAAGTAGTACGCAAGATTATTGAAAAAGAGCGCCCGGACGCGGTGCTG  
CCAACGATGGGCGGTGACACGGCGCTGAACTGCGCGCTGGAGCTGGAGCGTCAGGGCGTGTTGGAAGAGTTCGGC  
GTGACTATGATTGGTGCGACCGCCGATGCGATTGATAAAGCAGAAGACCGCCGTCGTTTCGACGTAGCGATGAAG  
AAAATTGGTCTGGAAAACCGCGCGTTCCGGTATCGCACACACGATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTG  
GGCTTCCCGTGCAATTATTCGCCCATCCTTTACCATGGGCGGTAGCGGCGGCGGTATCGCTTATAACCGCGAAGAG  
TTTGAAGAAATTTGCGCCCGCGGTCTGGATCTCTCCCAACCAAGAGCTGCTGATTGATGAGTCGCTGATCGGC  
TGAAAGA

**199. *Escherichia coli* K12 (SEQ ID NO. 199)****ECOK12**

GCAACCTACATCGAGCCGATTCACTGGGAAGTTGTACGCAAGATTATTGAAAAAGAGCGCCCGGACGCGGTGCTG  
CCAACGATGGGCGGTGACACGGCGCTGAACTGCGCGCTGGAGCTGGAACGTCAGGGCGTGTTGGAAGAGTTCGGT  
GTCACCATGATTGGTGCCACTGCCGATGCGATTGATAAAGCAGAAGACCGCCGTCGTTTCGACGTAGCGATGAAG  
AAAATTGGTCTGGAAAACCGCGCGTTCCGGTATCGCACACACGATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTG  
GGCTTCCCGTGCAATTATTCGCCCATCCTTTACCATGGGCGGTAGCGGCGGCGGTATCGCTTATAACCGTGAAGAG  
TTTGAAGAAATTTGCGCCCGCGGTCTGGATCTCTCTCCGACCAAGAGTTGCTGATTGATGAGTCGCTGATCGGC  
TGAAAGA

**200. *Pseudomonas aeruginosa* (SEQ ID NO. 200)****PAER**

CTACATCGAGCCGATCAAGTGGGCCACCGTGGCCAAGATCATCGAGAAGGAACGCCCCGACGCGCTGCTGCCGAC  
CATGGGCGGCCAGACCGCGCTGAACTGCGCCCTGGACCTGGAGCGCCACGGCGTGCTGGAGAAGTTCGGCGTGGA  
GATGATCGGCGCCAATGCCGATACCATCGACAAGGCCGAGGACCGCTCGCGCTTCGACAAGGCGATGAAGGATAT  
CGGCCTGGCCTGTCCGCGCTCGGGCATCGCCACAGCATGGAGGAGGCCTACGGCGTGCTCGAGCAGGTGCGGCTT  
CCCCTGCATCATCCGTCCGTCCCTTACCATGGGCGGCACCGGCGGCGGTATCGCCTACAACCGTGAAGAGTTCGA  
AGAGATCTGCGCCCGTGGCCTCGACCTGTCGCCGACCAACGAGCTGTTGATCGACGAGTCGCTGATCGGCTGGAA  
AGA

**201. *Escherichia coli* O157 :H7 (SEQ ID NO. 201)****ECO157**

GCGACCTACATCGAGCCGATTCACTGGGAAGTGGTACGTAAGATTATTGAAAAAGAGCGCCCGGACGCGGTGCTG  
CCAACCATGGGCGGTGACACGGCGCTGAACTGCGCGCTGGAGCTGGAACGTCAGGGCGTGTTGGAAGAGTTCGGC  
GTCACCATGATTGGTGCCACTGCCGATGCGATTGATAAAGCAGAAGACCGCCGTCGTTTCGACGTAGCGATGAAG  
AAAATTGGTCTGGAAAACCGCGCGTTCCGGTATCGCACATACGATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTG  
GGCTTCCCGTGCAATTATTCGCCCATCCTTTACCATGGGCGGTAGCGGCGGCGGTATCGCTTATAACCGCGAAGAG  
TTTGAAGAAATTTGCGCCCGCGGTCTGGATCTCTCTCCGACCAAGAGTTGCTGATTGATGAGTCGCTGATCGGC  
TGAAAGA

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**202. *Salmonella typhimurium* (SEQ ID NO. 202) STPM**

CCTACATCGAGCCGATTCACTGGGAAGTGGTGCGCAAAATCATTGAAAAAGAGCGTCCGGATGCGGTGCTGCCGA  
CCATGGGCGGCCAGACCGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTGGAAGAGTTCGGCGTCA  
CCATGATTGGTGCGACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATGAAGAAAA  
TTGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTGGGCT  
TCCCGTGTCATCATCCGGCCTAGCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGTGAAGAGTTCG  
AAGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGA  
AAGA

**203. *Salmonella enterica hadar* (SEQ ID NO. 203) SHAD**

TGATGCNCCTACATCGAGCCGATTCACTGGGAAGTGGTACGCAAAATCATCGAAAAAGAGCGTCCGGATGCGGTG  
CTGCCGACCATGGGCGGCCAGACGGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTGGAAGAGTTC  
GGCGTCACCATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATG  
AAGAAAATTGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGAC  
GTGGGCTTCCCGTGTCATCATCCGTCCGTCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGTGAA  
GAGTTCGAAGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATC  
GGCTGGAAAGA

**204. *Salmonella enteritidis* (SEQ ID NO. 204) SENT**

GGCTGATGCCCTACATCGAGCCGATTCACTGGGAAGTGGTACGCAAAATCATCGAAAAAGAGCGTCCGGATGCG  
GTGCTGCCGACCATGGGCGGCCAGACGGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTGGAAGAG  
TTCGGCGTCACCATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCG  
ATGAAGAAAATTGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCT  
GACGTGGGCTTCCCGTGTCATCATCCGTCCGTCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGT  
GAAGAGTTCGAAGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTG  
ATCGGCTGGAAAGA

**205. *Salmonella enterica Brandenburg* (SEQ ID NO. 205) SBRA**

TACATCGAGCCGATTCACTGGGAAGTGGTGCGCAAAATCATTGAAAAAGAGCGTCCGGATGCGGTGCTGCCGACC  
ATGGGCGGCCAGACGGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTCGAAGAGTTCGGCGTCACC  
ATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATGAAGAAAATT  
GGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGATGTGGGCTTC  
CCGTGTCATCATCCGTCCGTCTTTACCATGGGCGGCACCGGTGGCGGTATCGCTTACAACCGTGAAGAGTTCGAA  
GAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAAA  
GA

**206. *Salmonella enterica derby* (SEQ ID NO. 206) SDER**

CTACATCGAGCCGATTCACTGGGAAGTGGTGCGCAAAATCATCGAAAAAGAGCGTCCGGATGCGGTGCTGCCGAC  
CATGGGCGGCCAGACCGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTCGAAGAGTTCGGCGTCAC  
CATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATGAAGAAAAT



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CGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTGGGCTT  
CCCGTGCATCATCCGTCCGTCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGTGAAGAGTTCGA  
AGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAA  
AGA

**207. *Salmonella enterica virschow* (SEQ ID NO. 207) SVIR**

CTACATCGAGCCGATTCACTGGGAAGTGGTGCACAAAATCATTGAAAAAGAGCGTCCGGATGCAGTGCTGCCGAC  
CATGGGCGGCCAGACGCGCTGAACTGTGCGCTGGAGCTGGAGCGGCAGGGCGTGCTGGAAGAGTTCCGGCGTCAC  
CATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATGAAGAAAAT  
TGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTGGGCTT  
CCCGTGCATCATCCGTCCGTCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGTGAAGAGTTCGA  
AGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAA  
AGA

**208. *Salmonella paratyphi B* (SEQ ID NO. 208) SPTB**

CTACATCGAGCCGATTCACTGGGAAGTGGTGCACAAAATCATTGAAAAAGAGCGTCCGGATGCAGTGCTGCCGAC  
CATGGGCGGCCAGACCGCGCTGAACTGCGCGCTGGAGCTGGAGCGGCAGGGCGTGCTCGAAGAGTTCCGGCGTCAC  
CATGATTGGCGCCACCGCCGACGCCATTGATAAAGCCGAAGACCGTCGTCGCTTCGATATCGCGATGAAGAAAAT  
TGGTCTCGACACCGCGCGTTCCGGTATCGCGCACACTATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTGGGCTT  
CCCGTGCATCATCCGGCCTAGCTTTACCATGGGCGGCACCGGCGGCGGTATCGCTTACAACCGTGAAGAGTTCGA  
AGAAATCTGCGAACGCGGTCTGGACCTCTCGCCAACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAA  
AGA

**209. *Proteus vulgaris* (SEQ ID NO. 209) PVUL**

CGACAGTCATGACCGACCCCTGAAATGGCGGATGCCACCTACATCGAGCCTATTCATTGGCAAGTCGTCAGAAAAA  
TTATTGAAAAAGAGCGCCCTGATGCGATTTTGCCAACAATGGGGGGGCAAACGGCATTAAATTGCGCATTAGAAT  
TAGAACGTCAAGGTGTGTTAGCTGAATTCGGTGTGACCATGATTGGTGCTACGGCTGATGCTATCGATAAAGCAG  
AAGATAGACAACGCTTTGATAAAGCAATGAAAAAAATCGGCTTAGGCACAGCTCGCTCAGGTATTGCTCATAATC  
TAGAAGAAGCTTTTGCCGTCGCTGAAGATGTGCGATTCCCTTGCAATTCGTCCTTCATTTACTATGGGCGGCA  
CGGGGGGCGGTATCGCTTATAACCGTGAAGAAATTTGAAGAAATTTGTACTCGTGGATTAGATTTATCACCGACTA  
ACGAGTTATTGATTGATGAATCACTTATTGGTTGGAAAGAGTACGAGATGGAA

**210. *Enterobacter aerogenes* (SEQ ID NO. 210) EAER**

CGACACTCATGACCGACCCGAAATGGCCGATGCGACCTATATCGAGCCGATTCACTGGGAAGTGGTGCCTAAAA  
TTATCGAAAAAGAGCGTCCGGACGCGGTGCTGCCGACCATGGGCGGCCAGACCGCGCTGAACTGCGCGCTGGAGC  
TGGAGCGTCAGGGCGTGCTGGCAGAGTTCGGCGTGACCATGATTGGTGCGACCGCCGATGCGATCGATAAAGCGG  
AAGACCGCCGTCGCTTCGACGTGGCGATGAAGAAAATCGGTCTCGACACCGCGCGTTCCGGCATTGCGCACACCA  
TGGAAGAAGCGCTGGCGGTGGCCGCTGAAGTTGGCTTCCCATGCATCATCCGTCCGTCTTTACTATGGGCGGCA  
CCGGCGGCGGTATCGCCTATAACCGCGAAGAGTTCGAAGAAATCTGCGAACGCGGCCTGGATCTCTCTCCGACCA  
ACGAACTGCTGATTGATGAATCGCTGATCGGCTGGAAGGAATACGAAATGGAA

**211. *Burkholderia cepacia* (SEQ ID NO. 211) BCEP**

CGACAGTCATGACCGATCCGGACCGCGACATCACAGCGACAGTGATGCGTGAACGAACTAGGCTAGTGAAATTTA  
TCCGGCGCCGGATACGCGACCCGGACGATGCCGAGGACATCCTGCAGGATGTGTTTCACGAGTTCGTACAAGCGT  
ATCGACTTCCAGCGCCCATTTGAACAGGTGAGCGCGTGGCTTTTCCGTGCCGCGCGCAACCGAATCGTCGACCGTT  
TTCGCAAGAAGAAGGAGCAGCCGCTGGCCGACCTGTCGGAGGTCGACGATGACGCGAACAGCGAGTATCGCCTCG  
ACCTCGCGCTACCGGCGCATGATGCCGGCCCCGAAGCACTCTACGCTCGCACGCTCGTGCTCAAGGCCTTGCAGG  
ATGCGCTCGACGAGTTGCCGACGAATCAGCGTGACGTCTTTATCGCACACGAGCTGGAGGGTCAGTCATAAATGT  
CGA

**212. *Burkholderia mallei* (SEQ ID NO. 212)**

GGCGTTGCGTGAGGAGGGCTACAAGGTCATCCTCGTCAACAGCAACCCGGCGACGATCATGACCGATCCGAACAC  
GGCGGACGTCACGTACATCGAGCCGATCACGTGGGAAGTCGTCGAGCGCATCATCGCGAAGGAGCGCCCCGACGC  
GATCCTGCCGACGATGGGCGGCCAGACCGCGCTGAACTGCGCGCTCGACCTGTTCCACCACGGCGTGCTCGAGAA  
GTACGGCGTCGAGCTGATCGGCGCGTCGCCGGAGGCGATCGACAAGGCCGAAGACCGCCAGAAGTTCAAGGACGC  
GATGACGAAGATCGGCCTCGGCTCGGCGAAGTCCGGCATCGCGCACTCGATGGAAGAGGCGCTGAAGGTGCACGC  
GGACATCGCGGCGGCGACGGGCGGCAGCGGCTACCCGGTCGTGATCCGCCCGTCGTTACGCTCGGCGGCTCGGG  
CGGCGGCATCGCGTACAACCGCGAGGAGTTCGAGGAGATCTGCAAGCGCGGCCTCGATCTGTGCGCGACGCGCGA  
GCTGCTGATCGAGGAATCGCTGCTCGGCTGGAAGGAGTACGAGATGGAGGTCGTGCGCGATCGCGCCGACAACTG  
CATCATCGTCTGCTCG

**213. *Burkholderia pseudomallei* (SEQ ID NO. 213)**

GGCGTTGCGTGAGGAGGGCTACAAGGTCATCCTCGTCAACAGCAACCCGGCGACGATCATGACCGATCCGAACAC  
GGCGGACGTCACGTACATCGAGCCGATCACGTGGGAAGTCGTCGAGCGCATCATCGCGAAGGAGCGCCCCGACGC  
GATCCTGCCGACGATGGGCGGCCAAACCGCGCTGAACTGCGCGCTCGACCTGTTCCACCACGGCGTGCTCGAGAA  
GTACGGCGTCGAGCTGATCGGCGCGTCGCCGGAGGCGATCGACAAGGCCGAAGACCGCCAGAAGTTCAAGGACGC  
GATGACGAAGATCGGCCTCGGCTCGGCGAAGTCCGGCATCGCGCACTCGATGGAAGAGGCGCTGAAGGTGCACGC  
GGACATCGCGGCGGCGACGGGCGGCAGCGGCTACCCGGTCGTGATCCGCCCGTCGTTACGCTCGGCGGCTCGGG  
CGGCGGCATCGCGTACAACCGCGAGGAGTTCGAGGAGATCTGCAAGCGCGGCCTCGATCTGTGCGCGACGCGCGA  
GCTGCTGATCGAGGAATCGCTGCTCGGCTGGAAGGAGTACGAGATGGAGGTCGTGCGCGATCGCGCCGACAACTG  
CATCATCGTCTGCTCG

**214. *Legionella pneumophila* (SEQ ID NO. 214)**

CGACACTTATGACTGATCCTGAGCTTGCTGATGCCACCTATATAGAGCCTGTTCAATGGAAGAAGTGGCTCGTA  
TTATCGAAATAGAGAGGCCAGATGCTCTTTTACCGACGATGGGAGGACAAACAGCCTTAAACTGCGCCTTGGA  
TGTAAGAGAAGGGGTATTAGCCAAGTACTCTGTTGAAATGATAGGAGCGACGCGTGAAGCCATAGACAGGGCGG  
AAGATAGAGAAAAATTTGCCAGCTGATGATTAATAATCGGATTGGATATGCCAAGGTCGACGATTGCTCATAGCC  
TGGAAGAAGCAATTCAAGTACAAGCCGTTTAGGCTTTCCTGCCATCATCAGGCCTTCATTTACCATGGGTGGTA  
GTGGAGGCGGTATTGCCTATAATCGTGAAGAATTTGAAGAAATTTGCATTAGAGGATTGGAGTTGTGCGCAACTC  
ACGAGCTTTTGATTGATGAATCGGTTCTGGGTTGGAAAGAATATGAAATGGA

**215.      *Citrobacter freundii* (SEQ ID NO. 215)**

CGACACTTATGACTGATCCGGAAATGGCCGATGCCACCTACATCGAGCCGATTCACTGGGAAGTGGTACGCAAAA  
TCATTGAGAAAGAGCGCCCGGATGCGGTGCTGCCAACCATGGGCGGTGAGACGGCGCTGAACTGTGCGCTGGAGC  
TGGAACGCCAGGGCGTACTGGCTGAATTCGGCGTGACCATGATTGGCGCAACGGCGGATGCCATTGATAAAGCGG  
AAGACCGTCGTCGCTTTGATATCGCGATGAAGAAAATTGGTCTCGACACCGCGCGCTCTGGCATCGCTCACACCA  
TGGAAGAAGCGCTGGCGGTTGCTGCTGACGTGGGCTTCCCGTGCATCATCCGACCGAGCTTCACCATGGGCGGCA  
CCGGCGGCGGTATCGCTTATAACCGTGAAGAGTTCGAAGAGATTTGTGAACGCGGTCTGGACCTTTCCCCAACCA  
ACGAGCTGCTGATTGATGAATCGCTGATTGGCTGGAAAGAGTACGAAATGGA

**216.      *Acinetobacter baumanii* (SEQ ID NO. 216)      ABAU**

TCCATTTCTACTCTTTCCAGCCAATTAAAGATTCCTCGATCAATAATTGGTGAGTAGGAGAGAGGTGCAAACCA  
CGTTCACAAATCTCTAGGAATTCTTCGCGGTTATATGCAATACCACCGCCTGAACCACCCATAGTGAATGACGGA  
CGGATAATTACTGGGAAACCAAAGCGAGATTGAATTTCCAATGCTTCTTCCATTGTTTCAGCAATGGCAGCTTTT  
GGACATTCCAAGCCGATTTTGCGCATTGCTTCATCAAACAATTTACGGTCTTCAGCTTTTTCAATTGCTTCTTTT  
GTTGCACCAATAAGTTCTACGCCGATTTTTCTAATACACCATTTTCATCAAGTGCAAGTGCGCAGTTAAGAGCA  
GTTTGTCCACCCATAGTAGGGAGTACTGCATCTGGGCGCTCTTTTTCAATGATTTGAGCAACAGTTTGCCAAGTA  
ATTGGCTCAATATAAGTTGCATCAGCCATTGAAGGGTCAGTCATAAGTGTCTGA

**217.      *Serratia marcescens*      (SEQ ID NO. 217)      SMAR**

CGACAGTTATGACCGACCCGGAGATGGCCGACGCGACCTATATTGAGCCGATCCACTGGGAAGTGGTGCGCAAGA  
TCATCGAAAAAGAGCGCCCGGATGCGGTGCTGCCGACCATGGGCGGCCAGACGGCGCTGAACTGCGCGCTGGAGC  
TGAGAGCGCCAGGGCGTGCTGGCCGAGTTCGGCGTTACCATGATCGGCGCCACCGCCGATGCGATTGACAAGGCCG  
AAGACCGTCGCCGCTTCGATGTGGCGATGAAGAAAATCGGTCTGGATACCGCGCGTTCGGGCATCGCGCACACCA  
TGGAAGAAGCGCTGGCGGTAGCCGCTGACGTGGGCTTCCCGTGCATCATCCGCCCTTCCTTTACCATGGGCGGCA  
CCGGCGGCGGCATCGCCTACAACCGCGAAGAGTTCGAAGAGATCTGCGAACGCGGTCTGGACCTGTGCGCGACCA  
ACGAGCTGCTGATCGATGAATCGCTGATCGGTTGGAAAGAATACGAGATGGAA

**218.      *Pseudomonas putida*      (SEQ ID NO. 218)      PPUT**

CGACACTCATGACCGACCCCGGATTTGAGTGACCACCATGCCAAAACGTACAGACATCAAAGCATCCTGATTCT  
CGGTGCCGCGCCGATCGTGATCGGCCAGGCCTGTGAATTGCACTACTCCGGCGCCAGGCCTGCAAGGCCCTGCG  
CGAGGAAGGTTTCCGCGTCATCCTGGTGAATCCAACCCAGCCACCATCATGACCGACCCGGCCATGGCCGACGC  
CACCTACATCGAGCCGATCAAGTGGCAGTCGGTGGCCAAGATCATCGAGAAAGAGCGCCCGACGCCGTTTTGCC  
GACCATGGGTGGCCAGACCGCCCTGAACTGCGCCCTGGACCTGGAGCGCCACGGCGTTCTGGAGAAGTTTGGCGT  
AGAGATGATCGGTGCCAACGCCGATACCATCGACAAGGCTGAAGACCGCTCGCGCTTCGACAAGGCCATGAAAGA  
CATCGGCCTGGAATGCCGCGCTCGGGTATCGCCACAGCATGGAAGAGGCCAATGCGGTCTCGAAAAGCTCGG  
CTTCCCGTGCATCATTCGCCCGTCTTCACCATGGGGTGGCACCGGCGGTGGTATCGCTTACAACCGTGAAGAAT  
TCGAAGAAAT

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**219. *Morganella morganii* (SEQ ID NO. 219) MMOR**

CGAAAAAGAGCGCCCGGATGCCGTTCTGCCGACCATGGGCGGACAAACCGCGCTGAACTGTGCGCTGGATCTGGA  
ACGTCACGGCGTGCTGGCAGAGTTCGGCGTCGAAATGATTGGCGCGACAGCAGATGCGATTGATAAAGCCGAAGA  
TCGCCGCCGTTTCGATATCGCGATGAAAAAATCGGTCTGGATACAGCGCGTTCCGGTATCGCACACACCATGGA  
AGAAGCGTTTGGCGTCGCCGATGATGTCGGTTTCCCGTGCATTATCCGCCCGTCATTACCATGGGCGGCACCGG  
CGGCGGTATTGCGTATAACCGTGAAGAATTGAGGAAATCTGTACCCGCGGCCTGGATCTCTCCCTGACCAACGA  
ACTGCTGATTGATGAATCACTGATTGGCTGGAAAGAGTACGAAATGGAAAGGGCGAATTCCAGCACACTGGCGGC  
CGTTACTAGTGGATCA

**220. *Klebsiella oxytoca* (SEQ ID NO. 220) KOXY**

CGACAGTTATGACTGACCCGGAAATGGCCGATGCCACCTACATCGAGCCGATTCACTGGGAAGTGGTGCGCAAGA  
TCATTGAGAAAGAGCGTCCGGATGCGGTTCTGCCGACCATGGGCGGCCAGACGGCGCTGAACTGCGCGCTGGAGC  
TGGAGCGTCAGGGCGTGCTGGCCGAGTTCGGCGTGACCATGATTGGCGCGACCGCCGACGCGATTGATAAAGCCG  
AAGACCGCCGCCGTTTCGACGTGGCGATGAAGAAAATCGGTCTCGATACCGCGCGTTCCGGTATCGCGCATACCA  
TGGAAGAAGCGCTGGCGGTTGCCGCTGAAGTTGGCTTCCCGTGCATCATCCGTCCGTCTTTACGATGGGCGGCA  
CCGGCGGCGGTATCGCCTACAACCGCGAAGAGTTTGAAGAGATCTGCGAACGCGGTCTGGATCTCTCGCCGACCA  
ACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAAAGAATACGAAATGGAA

**221. *Moraxella catarrhalis* (SEQ ID NO. 221) MCAT**

CCACATTATGACTGACCCGTCCATGGCTGATGCCACTTATATTGAACCGATTACCTGGCAGACGGTAGAGCAAAT  
CATTGCCAAAGAGCGTCCTGATGCCATTTTGCCAACCATGGGTGGACAAACGGCACTTAACCTGTGCGCTTGACCT  
TGACAAACATGGCGTGCTTGCCAAATATGGCTGTGAGCTGATTGGGGCGACCAAAGAAGCCATTGAAAAAGCCGA  
AGACCGTGAACCTGTTTGATAAAGCCATGAAAAAATCGGTCTGGAATGCCCCAAAGCAGAAATTGCACAGAGCAT  
GGATGATGCTTTTGCCATTCAAGCTAAGGTTGGTTTCCGTGCATTATCCGCCCATCATTCACCATGGGGGGTTC  
TGGGGGTGGCATTGCTTATAACCGTGAGGAGTTTATTGAGATTTGTGAGCGTGGGTTTGAATTATCACCCACCCA  
CCAGCTGCTCATTGATGAGAGTTTAATCGGNTGGAAAGAGTANGAAATGGAA

**222. *Brucella melitensis* biovar 1 (SEQ ID NO. 222) BMEL1**

TCTTCGATCAGAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTTCGATAATCTCGAAGAATTCTTGACGGTTA  
TAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGCGGATGATCGCGGCAGGCCAACCACGTCGAGC  
GCCTGTGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCATTCCGGTT  
TCAAGCTTGTCGAGCGCCTTGTCAGTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGACCTCGTGG  
CGCTTGCGGTCTCATCCTTGATTTAGTCGCATTGGCGAACATCGAGCCCGGCGTGTGAGGCCGATCTTCTTC  
ATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGGCGCCGATCATCTCGACGTTA  
TAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGTCGGCAGG  
ATCGCGTCCGGGCGCTCCTTGCGGATGATCTTGCGGACGACTTCGGGCGTGATCGGCTCGATATAGGTTGCATCC  
GCCAGATCGGGATCAGTATAAAAT

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**223. *Brucella melitensis* biovar 2 (SEQ ID NO. 223) BMEL2**

TTCTTCGATCAGAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCCTGACGGTT  
ATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACACGTCGAG  
CGCCTGTGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCATTCCGGT  
TTCAAGCTTGTCGAGCGCCTTGTCAGTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGACCTCGTG  
GCGCTTGCGGTCCTCATCCTTGATTTAGTCGCATTGGCGAACATCGAGCCCGGCGTGTCGAGGCCGATCTTCTT  
CATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCCGATCATCTCGACGTT  
ATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGTCGGCAG  
GATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCGGGCGTGATCGGCTCGATATAGGTTGCATC  
CGCCAGATCGGGATCAGT

**224. *Brucella abortus* biovar 1 (SEQ ID NO. 224) BAB01**

TCTTCGATCAGTAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCCTGACGGTT  
ATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACACGTCGAG  
CGCCTGTGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCATTCCGGT  
TTCAAGCTTGTCGAGCGCCTTGTCAGTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGACCTCTTG  
GCGCTTGCGGTCCTCATCCTTGATTTAGTCGCATTGGCGAACATCGAGCCCGGCGTGTCGAGGCCGATCTTCTT  
CATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCCGATCATCTCGACGTT  
ATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGTCGGCAG  
GATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCGGGCGTGATCGGCTCGATATAGGTTGCATC  
CGCCAGATCGGGATCAG

**225. *Brucella abortus* biovar 2 (SEQ ID NO. 225) BAB02**

CGCCTCTTCGATCAGTAACTTCGGTCGTCCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCCTGA  
CGGTTATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACACG  
TCGAGCGCCTGTGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCAT  
TCGGTTTCAAGCTTGTCGAGCGCCTTGTCAGTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGACC  
TCTTGGCGCTTGCGGTCTCATCCTTGATTTAGTCGCATTGGCGAACATCGAGCCCGGCGTGTCGAGGCCGATC  
TTCTTCATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCGCCGATCATCTCG  
ACGTTATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGTC  
GGCAGGATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCGGGCGTGATCGGCTCGATATAGGTT  
GCATCCGCCAGATCGGGATCAGTATAAATTAGT

**226. *Brucella suis* biovar 1 (SEQ ID NO. 226) BSUI1**

TTAGANCGCCTCTTCGATCAGAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTC  
CTGACGGTTATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAAC  
CACGTCGAGCGCCTGCGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTG  
CCATTCCGTTTTCAAGCTTGTCGAGCGCCTTGTCAGTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTT  
GGCCTCGTGGCGCTTGCGGTCTCATCCTTGATTTAGTCGCATTGGCGAGCATCGAGCCCGGCGTGTCGAGGCC  
GATCTTCTTCATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCGCCGATCAT

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CTCGACGTTATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCAT  
CGTCGGCAGGATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCCGGCGTGATCGGCTCGATATA  
GGTTGCATCCGCCAGATCGGGATCAGTATAAA

**227. *Brucella suis* biovar 3 (SEQ ID NO. 227) BSUI3**

CCCGCATTCTTCGATCAGTAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCTCT  
GACGGTTATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACCA  
CGTCGAGCGCCTGCGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCC  
ATTTCGGTTTCAAGCTTGTTCGAGCGCCTTGTCAGTTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGG  
CCTCGTGGCGCTTGCGGTCTCATCCTTGATTTTCAGTCGCATTGGCGAGCATCGAGCCCCGGCGTGTTCGAGGCCGA  
TCTTCTTCATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCGCCGATCATCT  
CGACGTTATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCG  
TCGGCAGGATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCCGGCGTGATCGGCTCGATATAGG  
TTGCATCCGCCAGATCGGGATCAGTATAAAATTAGT

**228. *Brucella canis* (SEQ ID NO. 228) BCAN**

TTCTTCGATAGAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCTCTGACGGTTA  
TAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACACGTCGAGC  
GCCTGCGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCATTTCGGTT  
TCAAGCTTGTTCGAGCGCCTTGTCAGTTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGGCCTCGTGG  
CGCTTGCGGTCTCATCCTTGATTTTCAGTCGCATTGGCGAGCATCGAGCCCCGGCGTGTTCGAGGCCGATCTTCTTC  
ATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCGCCGATCATCTCGACGTTA  
TAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGTCGGCAGG  
ATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCCGGCGTGATCGGCTCGATATAGGTTGCATCC  
GCCAGATCGGGATCAGTATAAAAA

**229. *Brucella ovis* 69/290 (SEQ ID NO. 229) BOVI**

ACCGCTTCTTCGATCAGTAACTTCGGTCGTCGGCGAAGCGTCGAGGCCGCGTTCGATAATCTCGAAGAATTCTCTG  
ACGGTTATAGGCAATGCCGCCGCCGGTGCCGCCGAGCGTGAAGGAGGGGCGGATGATCGCGGGCAGGCCAACAC  
GTCGAGCGCCTGCGCTGCCTTTGCAAGCGCATGGCTCATATAGCGCTGCTTGCGCTCCACTTCGCCGAGCTGCCA  
TTCGGTTTCAAGCTTGTTCGAGCGCCTTGTCAGTTTCGTCGCCGAGAATTGCGCCTTCACCTCCGCGCGCTTGGC  
CTCGTGGCGCTTGCGGTCTCATCCTTGATTTTCAGTCGCATTGGCGAGCATCGAGCCCCGGCGTGTTCGAGGCCGAT  
CTTCTTCATGGCTTCGCGGAAGAGCGCGCGGTCTTCGGCCTTGTCGATAGCTTCGGCCTTGCGCGCCGATCATCTC  
GACGTTATAACGTTCAAGCACGCCCATGCGGCGCAAGGAAAGCGCGGTGTTGAGCGCGGTCTGTCCGCCCATCGT  
CGGCAGGATCGCGTCCGGGCGCTCCTTGGCGATGATCTTGGCGACGACTTCCGGCGTGATCGGCTCGATATAGGT  
TGCATCCGCCAGATCGGGATCAGTATAAAATT

**230. *Francisella tularensis* strain 4/j7 (SEQ ID NO. 230)**

CCNACTATTATGACTGATCCANCAACCGCAGATAAAATCTTTATCGAGCCAATTACGGTTGAGAGTGTTGGTAAA  
ATTATCGCTAGAGAAAGACCAGATGCAATCTTACCTACAGTAGGTGGACAAACTGCGCTTAAGTGTGCTTTAGCA

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TTAGACAAAGCTGGTATTTTAGAAAAATATAATGTCGAAATGCTTGGTGCAAAAGCTGACTCTATTGATAAGGCA  
GAAAAATAGAGAAAGATTTAACAAAGCCATGGCAAAAATTGGCTTAGAGGTTCTTAGAAATGTTGTAGTGCAATCG  
ATGGAGCAAGCTTATAAAGCTCTAGAAGATATCGGACTACCGGCTATTATCAGACCATCATTTACACTTGGTGGT  
AGCGGTGGTGGTATCGCTTATACAAAAGAAGAGTTTGAAAAAATTGTCAAAAATGGTCTAAGCCTATCACCAACA  
AATGAAGTACTAATAGAGAGGCACCCTAANAT

**231. *Francisella tularensis* strain sva/t7 (SEQ ID NO.231)**

ACGAANTAGACTGATCCAACAACCGCAGATAAAATCTTTATCGAGCCAATTACGGTTGAGAGTGTTGGTAAATTT  
ATCGCTAGAGAAAGACCAGATGCAATCTTACCTACAGTAGGTGGACAAACTGCGCTTAAGTGTGCTTTAGCATT  
GACAAAGCTGGTATTTTAGAAAAATATAATGTCGAAATGCTTGGTGCAAAAGCTGACTCTATTGATAAGGCAGAA  
AATAGAGAAAAATTTAACAAAGCCATGGCAAAAATTGGCTTAGAGGTTCTTAGAAATGTTGTAGTGCAATCGATG  
GAGCAAGCTTATAAAGCTCTAGAAGATATCGGACTACCGGCTATTATCAGACCATCATTTACACTTGGTGGTAGC  
GGTGGTGGTATCGCTTATACAAAAGAAGAGTTTGAAAAAATTGTCAAAAATGGTCTAAGCCTATCACCAACAAAT  
GAAGTACTAATAGATGAGNCANCTNAANC

**232. *Acinetobacter calcoaceticus* (SEQ ID NO. 232) ACAL**

CGACAGTTATGACTGATCCTTCAATGGCTGATGCAACTTATATTGAGCCGATTACTTGGCAAACAGTTGCACAGA  
TTATTGAAAAAGAACGTCCAGATGCAGTATTGCCAACTATGGGTGGTCAAAGTGCATTGAACTGTGCCCTCGCAC  
TTGATGAGCACGGCGTTCTTGCTAAATATAATGTTGAATTAATTGGTGCAAGCAAAGAAGCGATTGAGAAAGCCG  
AAGATCGTAAACTCTTCGATATCGCTATGCGCAAAATTGGCTTGAATGTCCAAAAGCTGCCATTGCTGAAACAA  
TGGAAGAAGCTTTAACAAATCCAGTCGCGCTTTGGTTTTCTGTAAATTATTCGTCCATCATTTACAATGGGTGGTT  
CGGGCGGTGGCATTGATATAACCGCGAAGAATTCCTTGAAATTTGTGAACGTGGTTTTGACCTCTCTCCTACTC  
ACCAGTTATTGATCGATGAATCTTTAATTGGCTGGAAAGAATACGAGATGGAA

**233. *Mycobacterium tuberculosis* (SEQ ID NO. 233)**

GGTGCTGCGCGCCGAGGGCTTGCAAGTCAGCCTGGTGAAGTCTAATCCGGCCACCATCATGACCGACCCGGAGTT  
CGCCGACCACACCTACGTAGAGCCCATACCCCGGCGTTTCGTGGAGCGGGTTATCGCCCAACAGGCCGAGCGGGG  
CAACAAGATCGACGCCCTGCTGGCGACCCTGGGTGGGCAGACCGCGCTGAACACCGCGGTTCGCGCTGTACGAGAG  
CGGGGTGCTGGAAAAGTACGGCGTGGAAGTTCATCGGCGCCGATTTTCGACGCCATCCAGCGCGGCGAGGACCGGCA  
GCGGTTCAAGGACATCGTCGCCAAGGCCGGTGGCGAATCCGCCCGGAGCCGAGTGTGTTTTACCATGGCCGAAGT  
GCGTGAGACGGTCGCCGAGCTCGGCCTGCCGGTGGTGGTGCGGCCGAGCTTCACCATGGGCGGGCTGGGTTCGGG  
GATAGCGTACTCCACCGACGAGGTCGACCGGATGGCCGGCGCCGGGCTGGCGGCCTCGCCACGCGCAACGTGCT  
CATCGAGGAATCGATTTACGGCTGGAAGGAATTCGAACTCGAGCTGATGCGCGACGGCCACGACAATGTGGTGGT  
GGTGTGCTCGATCGAAA

**234. *Mycobacterium bovis* subspecies *bovis* (SEQ ID NO. 234)**

GGTGCTGCGCGCCGAGGGCTTGCAAGTCAGCCTGGTGAAGTCTAATCCGGCCACCATCATGACCGACCCGGAGTT  
CGCCGACCACACCTACGTAGAGCCCATACCCCGGCGTTTCGTGGAGCGGGTTATCGCCCAACAGGCCGAGCGGGG  
CAACAAGATCGACGCCCTGCTGGCGACCCTGGGTGGGCAGACCGCGCTGAACACCGCGGTTCGCGCTGTACGAGAG  
CGGGGTGCTGGAAAAGTACGGCGTGGAAGTTCGAACTCGAGCTGATGCGCGACGGCCACGACAATGTGGTGGT

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GCGGTTCAAGGACATCGTCGCCAAGGCCGGTGGCGAATCCGCCCGGAGCCGAGTGTGTTTCACCATGGCCGAAGT  
GCGTGAGACGGTCGCCGAGCTCGGCCTGCCGGTGGTGGTGCGGCCGAGCTTCACCATGGGCGGGCTGGGTTTCGGG  
GATAGCGTACTCCACCGACGAGGTGACCGGATGGCCGGCGCCGGGCTGGCGGCCTCGCCCAGCGCCAACGTGCT  
CATCGAGGAATCGATTTACGGCTGGAAGGAATTCGAACTCGAGCTGATGCGCGACGGCCACGACAACGTGGTGGT  
GGTGTGCTCGATCGAAA

**235. *Mycobacterium avium subspecies paratuberculosis***  
**(SEQ ID NO. 235)**

GGTGCTCAAGGCCGAGGGCCTGCAGGTGAGCCTGGTCAACTCCAACCCGGCCACCATCATGACCGATCCGGAGTA  
CGCCGACCACACCTACGTGAGCCCATCACGCCGGCCTTCGTGCAACGGGTGATCGCGCAGCAGGCCGAGCGGGG  
CAACAAGATCGACGCGCTGCTGGCCACCCTGGGCGGGCAGACCGCGCTGAACACCGCCGTCGCGCTGTACGAGAA  
CGGGGCGCTGGACCGCTACGGGGTGGAACTGATCGGCGCCGACTTCGACGCCATCCAGCGCGGCGAGGACCGGCA  
GCGGTTCAAGGACATCGTCGCCAAGGTGCGCGGTGAATCCGCCCGCAGCCGAGTGTGTTTCACCATGGACGAGGT  
GCGCGAGACCGTCGCCGAACCTGGGCCTGCCGGTGGTGGTGCGGCCGAGCTTCACCATGGGCGGCCTGGGCTCGGG  
GATGGCGCGCTCCGTGAGGAGGTGACCGGATGGCCGGCGCCGGGCTGGCCGAAAGCCCCAGCGCCAACGTGCT  
GATCGAGGAATCCATCTACGGCTGGAAGGAATTCGAACTCGAGCTGATGCGCGACGGCAACGACAACGTGCTCGT  
GGTGTGCTCGATCGA

**236. *Mycobacterium leprae* (SEQ ID NO. 236)**

CAAGTGAGTCTGGTCAACTCTAACCCGGCCACCATCATGACCGATCCGGAGTTCGCCGACCACACCTATGTGAG  
CCGATTACGCCGGCCTTCGTGGAGCGGGTGATTGTTTCAGCAGGCCGAGCGTGGCAACAGGATTGACGCTTTGCTA  
GCCACCTTAGGTGGGCGAGACCGCGCTCAACACAGCGGTAGCGCTGTACGAAAACGGAGTGTTGGAGCGCTATGGC  
GTCGAGCTCATCGGTGCTGATTTTCAGGGCTATCCAGCGTGGTGAGGACCGGCAGCGATTCAAAGATCTCGTCGCT  
AAGGTTGGTGGTGAATCCGCTCGCAGTAAAGTGTGTTTCACCATGGATGAGGTGCGTGAAACAGTCGAGGATCTT  
GGCCTTCGGTGGTGGTGCGGCCAAGTTTCACGATGGGCGGATTGGGTTTCGGGCATGGCTCACTCCGACGAGGAG  
GTTGGCCGATGGCCGGCGCCGGGCTGGTAGCTTCACCTAGTGCCAACGTGCTGATCGAGGAATCGGTCTATGGT  
TGGAAGGAATTCGAACTCGAGCTAATGCGCGATGGACACGACAGCGTCGTGGTGGTGTGCTCGATCGAGAACGTT

**237. *Nocardia farcinica* (SEQ ID NO. 237)**

GGTGCTCAAGTCCGAGGGCCTGCGCGTGTGCTGGTGAATCGAACCCGGCCACGATCATGACCGATCCCGAGTT  
CGCCGACGCCACCTACGTGAGCCGATACCCCCGAATTCGTGAGAAAGGTCATCGCCAAGGAGCGCCCCGACGC  
GATCCTGGCGACCTCGGCGGGCAGACCGCGCTCAACACCGCGGTGCGCTGCACGAGCGCGGCGTGCTGGAGAA  
GTACGGCGTCGAACTGATCGGCGCCGACTTCGACGCCATCCAGCGCGGTGAGGACCGGCAGAAGTTCAAGGACAT  
CGTCGCCAAGGTCGGCGGTGAGAGCGCCGCTCGCGGGTCTGCTTCACCATGGACGAGGTCCGCGAGACCGTCGC  
CGAACTGGGCTTCCCGGTGCTGCTGCGGCCCTCGTTACCATGGGCGGGCTCGGCTCGGGCATGGCCTACAACGA  
CGAGGACCTGGACCGGATCGCCGGTGGCGGCCTGGCCGCCTCGCCGACCGCCAACGTCTTGATCGAGGAGTCCAT  
CCTCGGCTGGAAGGAATACGAGCTCGAGCTCATGCGCGACGGCCGCGACAACGTGCTGGTGGTCTGCTCCATCGA  
GAACGTCGACCCGATGGG



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**238. *Streptomyces coelicolor* (SEQ ID NO. 238)**

CCGGCGACGATCATGACCGACCCGGAGATCGCCGACGCCACCTACGTCGAGCCGATCACCCCGAGTTCGTCGAG  
AAGATCATCGCCAAGGAGCGCCCCGACGCCCTCCTGCCCACGCTCGGCGGCCAGACGGCCCTGAACACCGCGATC  
TCCCTGCACGGCAACGGCGTCCTGGAGAAGTACGGCGTCGAACTGATCGGCGCCAATGTGGAGGCCATCAACAAG  
GGCGAGGACCGCGACCTGTTCAAGGAGGTCGTCGAGGAGGTCCGCAAGAAGATCGGCCACGGCGAGTCCGCCCGG  
TCCTACATCTGCCACTCCATGGACGACGTCCTCAAGGGCGTCGACGCGCTCGGCGGCTACCCCGTCGTCGTCCGC  
CCCTCCTTCACCATGGGCGGCGCCGGCTCCGGCTTCGCCCACGACGAGGACGAACGCGCCGGATCGCCGGACAG  
GGCCTCACCTCTCGCCGACCACCGAGGTGCTCCTGGAGGAGTCCATCCTCGGCTGGAAGGAGTACGAGCTGGAG

**239. *Streptomyces avermitilis* (SEQ ID NO. 239)**

ATCCTGCGCGCCGAGGGCCTCAGGGTCATCCTGGTCAACTCCAACCCGGCGACGATCATGACCGACCCGGAGATC  
GCCGACGCCACCTACGTCGAGCCGATCACCCCGAGTTCGTCGAGAAGATCATCGCCAAGGAGCGGCCGGACGCG  
CTGCTGCCCACCCTCGGTGGTCAGACGGCCCTGAACACCGCCATCTCCATGCACGAGCAGGGTGTGCTGGAGAAG  
TACGGTGTGAGCTGATCGGCGCCAACGTCGAGGCGATCAACAAGGGCGAGGACCGCGACCTGTTCAAGGGCGTCT  
GTCGAGGCCGTCCGCGCGAAGATCGGGCACGGCGAATCCGCCCCGCTCGGTTCATCTGCCACTCCATGGACGACGTG  
CTCGAGGGCGTCGAGACCCTCGGCGGTTACCCCGTCGTCGTCCGTCCCTCCTTCACCATGGGCGGCGCCGGCTCC  
GGCTTCGCGCACGACGAGGAGGAGCTGCGCCGATCGCGGGTCAGGGCCTGACGCTCTCCCCGACCACCGAGGTG  
CTCCTGGAGGAGTCCATCCTCGGCTGGAAGGAGTACGAGCTGGAGCTGATGCGCGACAAGAACGACAACGTCGTG  
GTCGTCTGCTCCATCGAG

**240. *Corynebacterium efficiens* (SEQ ID NO. 240)**

TGCTCAAGGAGGAGGGCCTGCGCGTCACCCTCATCAACTCCAACCCGGCCACCATCATGACCGACCCGAGATGG  
CGGACCACACCTACGTCGAGCCGATCGAGCCCGAGTACATCGAGAAGATCTTCAGAAGGAGATCGAACAGGGCC  
ACCCGATCGACACCGTCCTGGCAACCCTCGGCGGACAAACCGCCCTTAACGCTGCCATCCAGCTGGACCGCCTCG  
GCATCCTGGAGAAGTACAACGTCGAGCTCATCGGTGCCGACATCGACGCCATCGAGCGTGGTGAGGACCGCCAGA  
AATTCAAGGACATCGTCGCCACCATCGGTGGTGAATCAGCACGCTCCGCGTCTGCCACAACATGGATGAGGTCT  
ACGCCACCGTCGAGGAGCTCGGTCTCCCGGTGTCGTGCGCCCCTCCTTCACCATGGGTGGTCTGGGTTCGGTCT  
TGGCCTACACCATGGAGGACCTCGACCGCATCGCCGGCGGTGGCCTCGCCGCTCCCCGGAGGCCAATGTCCTGA  
TCGAGGAGTCCATCCTCGGCTGGAAGGAATACGAGCTGGAGCTCATGCGCGACGGCGATGACAATGTGGTGGTCA  
TCTGCTCCATCGAGAACGTCGATGC

**241. *Corynebacterium glutamicum* (SEQ ID NO. 241)**

CTGAAGGAAGAGGGACTGCGCGTCACCCTCATCAACTCCAACCCAGCAACGATCATGACCGACCCAGAAATGGCT  
GACCACACCTACGTGGAGCCAATCGAGCCGGAATACATCGACAAGATTTTCGCTAAGGAAATCGAGCAGGGCCAC  
CCAATCGACGCCGTCTGGCAACCCTTGGTGGCCAGACTGCACTTAACGCAGCTATCCAGCTGGATCGCCTCGGC  
ATCCTGGAAAAGTACGGCGTTGAACTCATCGGTGCAGACATCGATGCCATTGAGCGCGGCGAAGATCGCCAGAAG  
TTCAAGGATATTGTCACCACCATCGGTGGCGAATCCGCGCGTTCGCGCGTCTGCCACAACATGGAAGAAGTCCAC  
GAGACTGTGCGAGAACTCGGCCTTCAGTAGTCGTGCGTCCATCCTTCACTATGGGTGGCCTGGGCTCCGGTCTT  
GCATACAACACCGAAGACCTTGAGCGCATCGCTGGTGGCGGACTTGCTGCATCTCCTGAAGCAAACGTCTTGATC

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GAAGAATCCATCCTTGTTGGAAGGAATTCGAGCTCGAGCTCATGCGGATACCGCAGACAACGTTGTGGTTATC  
TGCTCCATTGAAAACGTGACGCACTGGGCGTGAC

**242. *Bordetella parapertussis* (SEQ ID NO. 242)**

CCCGCCACCATCATGACCGACCCCGAAACGGCGGACGTACCTATATCGAGCCCATCACGTGGCAAGCGGTCGAG  
AAGATCATCGAGCGCGAGAAGCCCGATGCGCTGCTGCCACCATGGGTGGCCAGACCGCGCTGAACTGCGCGCTC  
GACCTGGCCCCACCACGGCGTGCTGAAAAAGCACAACTCGAGCTGATCGGCGCCAACGAGCAGCCATCGAGAAG  
GCCGAAGACCGCCAGAAGTTCAAGCAGGCCATGACCGACATCGGCCTGGAATCGGCCAAGTCGGGCGTGCCCCAC  
TCGATGGACGAGGCCTGGGAAGTGCAGCGCCGATCGCGGCCGACATCGGCACGGCGGGCTTTCCCGTCGTCATC  
CGCCCCAGCTTACGCTGGGCGGCTCGGGCGGCGGCATCGCCTATAACGCCGAGGAATTCGAGGTCATCTGCCGC  
CGCGGCCTGGAAGCCTCGCCGACCAAGGAGCTGCTGATCGAGGAGTCGCTGCTCGGCTGGAAAGAGTTCGAGATG

**243. *Bordetella bronchiseptica* (SEQ ID NO. 243)**

GCGCTCAAGGCCGAGGGTTACCGGACCATCCTGGTCAACAGCAACCCGCCACCATCATGACCGACCCCGAAACG  
GCGGACGTACCTATATCGAGCCCATCACGTGGCAAGCGGTCGAGAAGATCATCGAGCGCGAGAAGCCCGATGCG  
CTGCTGCCACCATGGGCGGCCAGACCGCGCTGAACTGCGCGCTCGACCTGGCCCCACCACGGCGTGCTGAAAAAG  
CACAACTCGAGCTGATCGGCGCCAACGAGCAGCCATCGAGAAGGCCGAAGACCGCCAGAAGTTCAAGCAGGCC  
ATGACCGACATCGGCCTGGAATCGGCCAAGTCGGGCGTGCCCCACTCGATGGACGAGGCCTGGGAAGTGCAGCGC  
CGCATCGCGGCCGACATCGGCACGGCGGGCTTTCCCGTCGTCATCCGCCCCAGCTTACGCTGGGCGGCTCGGGC  
GGCGGCATCGCCTATAACGCCGAGGAATTCGAGGTCATCTGCCGCCGCGGGCTGGAAGCCTCGCCGACCAAGGAG  
CTGCTGATCGAGGAGTCGCTGCTCGGCTGGAAAGAGTTCGAGATGGAAGTGGTGCGGACAAGGCGGACAACTGC  
ATCATCGTCTGCTCGAT

**244. *Bordetella pertussis* (SEQ ID NO. 244)**

GCGCTCAAGGCCGAGGGTTACCGGACCATCCTGGTCAACAGCAACCCGCCACCATCATGACCGACCCCGAAACG  
GCGGACGTACCTATATCGAGCCCATCACGTGGCAAGCGGTCGAGAAGATCATCGAGCGCGAGAAGCCCGATGCG  
CTGCTGCCACCATGGGTGGCCAGACCGCGCTGAACTGCGCGCTCGACCTGGCCCCACCACGGCGTGCTGAAAAAG  
CACAACTCGAGCTGATCGGCGCCAACGAGCAGCCATCGAGAAGGCCGAAGACCGCCAGAAGTTCAAGCAGGCC  
ATGACCGACATCGGCCTGGAATCGGCCAAGTCGGGCGTGCCCCACTCGATGGACGAGGCCTGGGAAGTGCAGCGC  
CGCATCGCGGCCGACATCGGCACGGCGGGCTTTCCCGTCGTCATCCGCCCCAGCTTACGCTGGGCGGCTCGGGC  
GGCGGCATCGCCTATAACGCCGAGGAATTCGAAGTCATCTGCCGCCGCGGGCTGGAAGCCTCGCCGACCAAGGAG  
CTGCTGATCGAGGAGTCGCTGCTCGGCTGGAAAGAGTTCGAGATGGAAGTGGTGCGGACAAGGCGGACAACTGC  
ATCATCGTCTGCTCGAT

**245. *Burkholderia mallei* (SEQ ID NO. 245)**

GGCGTTGCGTGAGGAGGGCTACAAGGTCATCTCGTCAACAGCAACCCGGCGACGATCATGACCGATCCGAACAC  
GGCGGACGTACGTACATCGAGCCGATCACGTGGGAAGTCGTCGAGCGCATCATCGCGAAGGAGCGCCCCGACGC  
GATCTGCCGACGATGGGCGGCCAGACCGCGCTGAACTGCGCGCTCGACCTGTTCCACCAGGCGTGCTCGAGAA  
GTACGGCGTCGAGCTGATCGGCGGTCGCCGAGGCGATCGACAAGGCCGAAGACCGCCAGAAGTTCAAGGACGC  
GATGACGAAGATCGGCCTCGGCTCGGCGAAGTCCGGCATCGCGCACTCGATGGAAGAGGCGCTGAAGGTGCACGC

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GGACATCGCGGCGGCGACGGGCGGCAGCGGCTACCCGGTCTGTGATCCGCCCGTCTGTTACGCTCGGCGGCTCGGG  
CGGCGGCATCGCGTACAACCGCGAGGAGTTCGAGGAGATCTGCAAGCGCGGCCTCGATCTGTGCGCGACGCGCGA  
GCTGCTGATCGAGGAATCGCTGCTCGGCTGGAAGGAGTACGAGATGGAGGTCGTGCGCGATCGCGCCGACAACTG  
CATCATCGTCTGCTCG

**246. *Burkholderia pseudomallei* (SEQ ID NO. 246)**

GGCGTTGCGTGAGGAGGGCTACAAGGTCATCCTCGTCAACAGCAACCCGGCGACGATCATGACCGATCCGAACAC  
GGCGGACGTCACGTACATCGAGCCGATCACGTGGGAAGTCGTGAGCGCATCATCGCGAAGGAGCGCCCCGACGC  
GATCCTGCCGACGATGGGCGGCCAAACCGCGCTGAACTGCGCGCTCGACCTGTTCCACCACGGCGTGCTCGAGAA  
GTACGGCGTCGAGCTGATCGGCGCGTCGCCGGAGGCGATCGACAAGGCCGAAGACCGCCAGAAGTTC AAGGACGC  
GATGACGAAGATCGGCCTCGGCTCGGCGAAGTCCGGCATCGCGCACTCGATGGAAGAGGCGCTGAAGGTGCACGC  
GGACATCGCGGCGGCGACGGGCGGCAGCGGCTACCCGGTCTGTGATCCGCCCGTCTGTTACGCTCGGCGGCTCGGG  
CGGCGGCATCGCGTACAACCGCGAGGAGTTCGAGGAGATCTGCAAGCGCGGCCTCGATCTGTGCGCGACGCGCGA  
GCTGCTGATCGAGGAATCGCTGCTCGGCTGGAAGGAGTACGAGATGGAGGTCGTGCGCGATCGCGCCGACAACTG  
CATCATCGTCTGCTCG

**247. *Pseudomonas putida* (SEQ ID NO. 247)**

GCCTGTAAAGCCCTGCGCGAGGAAGGTTTCCGCGTCATCCTGGTGAACCTCCAACCCAGCCACCATCATGACCGAC  
CCGGCCATGGCTGACGCCACCTACATCGAGCCGATCAAGTGGCAATCGGTGGCCAAGATCATCGAGAAAGAGCGC  
CCGGACGCCGTCCTGCCGACCATGGGTGGCCAGACCGCCCTGAACTGCGCCCTGGACCTGGAGCGCCACGGCGTT  
CTGGAGAAGTTCGGCGTGAGATGATCGGTGCCAACGCTGACACCATCGACAAGGCCGAAGACCGTTTCGCGCTTC  
GACAAGGCCATGAAGGACATCGGCCTGGAGTGCCCGCGCTCCGGTATCGCCCACAGCATGGAAGAGGCCAATGCG  
GTCTCTGAGAAGCTCGGCTTCCCGTGTCATCATTCGCCCGTCTGTTACCATGGGCGGCACCGGCGGCGGTATCGCT  
TACAACCGTGAAGAGTTCGAAGAAATCTGCACCCGTGGTCTGGACCTGTGCGCGACCAAAGAGCTGCTGATCGAC  
GAATCGCTGATCGGCTGGAAGGAATACGAGATGGAGGTGGTCCGCGACAAGAAGGACAACCTGCATCATCGTCTGC  
TCGATCGAGAACTTCGACCCGATGG

**248. *Yersinia pseudotuberculosis* (SEQ ID NO. 248)**

ATGCCAAAACGTACAGATATAAAAAGCATCCTGATTCTGGGCGCAGGCCCGATTGTTATCGGCCAGGCTTGTGAG  
TTTGACTACTCCGGTGCCCAAGCGTGTAAGCACTGCGCGAAGAGGGTTACCGTGTCATTTTGGTGAACCTCCAAT  
CCGGCGACTATCATGACTGACCCGGAATGGCCGATGCAACTTATATCGAGCCAATTCAATTGGGAAGTGGTGCGT  
AAGATTATCGAAAAAGAGCGTCCAGATGCTGTTTTGCCTACGATGGGTGGCCAAACTGCACTGAACTGTGCATTG  
GAACTGGAGCGTCAGGGTGTTCTGGCAGAATTTGGCGTCACCATGATTGGTGCGACCGCCGATGCCATCGATAAA  
GCCGAAGACCGCCGTCGCTTTGATATCGCGATGAAGAAGATTGGTCTGGATACGGCCCGCTCAGGTATTGCGCAT  
AACATGGAAGAAGCACTGGCTGTTGCCGCTGATGTGGGCTTCCCGTGCAATTATCCGCCCATCCTTTACGATGGGG  
GGCACTGGTGGCGGTATCGCTTATAACCGTGAAGAGTTCGAAGAGATCTGCGAGCGCGGTCTGGATTTGTCACCA  
ACCAAAGAGTTGTTGATTGACGAATCGCTGATTGGCTGGAAAGAGTACGAGATGGAAGTTGTCCGTGATAAAAAC  
GACAACTGCATCATCGTTTGCTCCATTGAAAACCTTCGATGCGATGGGGATTACACCCGGCGACTCTATCACTGTCT  
GCACCGGCTCAGACCCTGACCGATAAAGAATACCAAATCATGCGTAATGCCTCGATGGCGGTACTGCGTGAAATC  
GGGGTAGAAACCGGGGGCTCTAACGTACAGTTCTCCGTCAACCCAAAAAATGGTCTGTTTGATTGTCAATTGAGATG

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AACCCGCGTGTTCCTCGCTCTTCAGCACTGGCCTCTAAAGCAACCGGTTTCCCGATTGCCAAGATTGCCGCCAAA  
CTGGCGGTTCGGTTACACACTGGATGAGTTGATGAATGACATCACCGGTGGCCGTA CTCTGCGTCCTTTGAGCCT  
TCTATCGACTATGTTGTTACCAAGATCCACGCTTTAACTTTGAAAAATTTGCGGGTGCCAACGACCGTTTGACC  
ACGCAAATGAAGTCTGTGGGTGAAGTCATGGCCATTGGCCGCACGCAGCAAGAATCACTGCAAAAAGCACTGCGC  
GGGCTGGAAGTGGGCGCGACCGGTTTTGACCCGAAAGTGAGCCTGGATGATCCCGAAGCACTGACTAAAATTCGT  
CGTGAATTGAAAGAAGCGGGTGCAAGCTATCTGGTATATCGCTGATGCTTTCCGTGCGGGCATGTGCGTTGAT  
GGTGTGTTCAATCTGACCAATGTTGATCGCTGGTTCCTGGTGCAGATTGAAGAGCTGGTTTCGTCTGGAAGAGAGC  
GTGGCAGAACTCGGTATCAACGGCTTGACTGCTGAATTTATGCGTCACTTGAAACGTAAAGGTTTCGCCGATGCT  
CGTTTGGCTAAATTGGTCGGTGCAAGCAAGTGAAAGTCCGTAACTGCGTTACAAATATGGTTTACACCCGGTT  
TATAAGCGTGTGATACCTGCGCGGCAGAGTTCTCGACGGATACGGCTTACATGTACTCCACCTACGAGGAAGAG  
TGCGAATCTAACCAACCAGCGATCGTCCGAAAGTGATGGTGC TGGGTGGCGGCCCGAACCGTATCGGACAAGGT  
ATTGAGTTCGACTATTGCTGCGTACACGCTTCATTGGCACTGCGTGAAGACGGTTACGAAACCATCATGGTGAAC  
TGTAACCTGAGACGGTTTCAACCGATTATGACACCTCTGATCGTCTCTACTTCGAGTCAGTCACGCTGGAAGAT  
GTGTTGGAATTTGTCCGTATTGAGAAACCACAGGGCGTTATCGTGCAGTACGGTGGTCAGACACCGCTGAAATTA  
GCCGCGAGTTGGAAGCGGTGGCGTCCCCATTATTGGGACCAGTCCGGATGCCATTGACCGTGCCGAAGACCGT  
GAGCGTTTCCAGCAGGCGGTAAATCGTCTGGGCTGAAACAGCCAGCGAATGCCACCGTAGCGACTATCGAGCAG  
GCGGTGAAAAAGCCACTGGTCTGGGCTATCCACTGGTTCGTACGCCCTTCTTATGTTTTGGGTGGCCGCGCGATG  
GAAATTGTTTATGACGAGATTGACCTGCGCCGTACTTCCAGAATGCCGTCA GTGTATCGAATGATGCGCCGGTA  
TTGCTTGACCGCTTCCTTGATGATGCCGTGCAAGTGATGTCGATGCCATTTGTGATGGTGAACGCGTGTGATC  
GGCGGCATTATGGAACATATAGAGCAAGCCGGGGTCACTCTGGTGACTCAGCCTGTTTATTGCTGCTTACACC  
CTGAGCAAAGAAATTCAGGATGTGATGCGCCAACAAGTGGA AAAACTGGCCTTTGAACTCTGTGTCCGCGGCCCTG  
ATGAATGTGCAGTTTTCGGTGAAAAACAACGAAGTTTACCTGATTGAGGTTAACCCACGGGCGGCCCGTACTGTA  
CCTTTCGTGTCCAAAGCGACCGGTATGCCACTGGCAAAAATTGCCGCTCGTGTGATGGTTCGGCCAATCGCTGGCT  
GAGCAGGGCATGCTGGAAGAAATATTCCGCCTTACTACTCAGTCAAGGAAGTGGTACTGCCGTTTAATAAATTC  
CCCGGTGTTGACCAATTTTAGGGCCAGAAATGCGCTCTACCGGTGAAGTCATGGGGGTTGGCCGTACCTTCGCT  
GAGGCGTTCTCTAAAGCGATGTTGGGCAGTCAATCTGGCATGAAAAAGAGTGGCCGTGCGCTATTATCCGTCCGT  
GAGGGGGATAAGCACCGGGTGGTAGACTTGGCGGCGAAGCTGCTAAAACAAGGCTTTGAACTGGATGCAACCCAC  
GGAACGGCGGTCTGCTGTTGGGCGAGGCGGGGATAAACCCACGTTTGGTTAACAAGGTGCATGAAGGCCGTCCGCAT  
ATTCAGGACCGTATTAAGAATGGCGAGTACACCTATATCGTGAATACCACAGCTGGGCGTCAGGCGATTGAAGAT  
TCTAAGCTGATCCGTGCGAGTGCTTTGCAATATAAAGTGCATTACGATACGACCTTGAACGGTGGTTTTGCTACG  
GCGATGGCGTTAAATGCGGATCCAACCGATCAAGTGATTTCCGTGCAAGAGATGCATGCCAAGATTAAGAATATG  
AAAGCGTAA

**249. *Yersinia pestis* (SEQ ID NO. 249)**

ATGCCAAAACGTACAGATATAAAAAGCATCCTGATTCTGGGCGCAGGCCCGATTGTTATCGGCCAGGCTTGTGAG  
TTTGA CTACTCCGGTGCCCAAGCGTGTAAGCACTGCGCGAAGAGGGTTACCGTGTCATTTTGGTGAACCTCCAAT  
CTGGCGACTATCATGACTGACCCGGAAATGGCCGATGCAACTTATATCGAGCCAATTCATTGGGAAGTGGTGCCT  
AAGATTATCGAAAAAGAGCGTCCAGATGCTGTTTTGCCCTACGATGGGTGGCCAACTGCACTGAACTGTGCATTG  
GAACTGGAGCGTCAGGGTGTCTGGCAGAAATTTGGCGTCACCATGATTGGTGCACCGCCGATGCCATCGATAAA  
GCCGAAGACCGCCGTGCTTTGATATCGCGATGAAGAAGATTGGTCTGGATACGGCCCGCTCAGGTATTGCGCAT

AACATGGAAGAAGCACTGGCTGTTGCCGCTGATGTGGGCTTCCCGTGCATTATCCGCCCATCCTTTACGATGGGG  
GGCACTGGTGGCGGTATCGCTTATAACCGTGAAGAGTTTGAAGAGATCTGCGAGCGCGGTCTGGATTTGTCTCCA  
ACCAAAGAGTTGTTGATTGACGAATCGCTGATTGGCTGGAAGAGTACGAGATGGAAGTTGTCCGTGATAAAAAC  
GACAACTGCATCATCGTTTGCTCCATTGAAAACCTTCGATGCGATGGGGATTACACCGGCGACTCTATCACTGTC  
GCACCGGCTCAGACCCTGACCGATAAAGAATACCAAATCATGCGTAATGCCTCGATGGCGGTACTGCGTGAAATC  
GGGGTAGAAAACGGGGGCTCTAACGTACAGTTCTCCGTCAACCCAAAAAATGGTCGTTTGATTGTCATTGAGATG  
AACCCGCGTGTCTCTCGCTCTTCAGCACTGGCCTCTAAAGCAACCGGTTTCCCGATTGCCAAGATTGCCGCCAAA  
CTGGCGGTTCGTTACACACTGGATGAGTTGATGAATGACATCACCGGTGGCCGTACTCCTGCGTCCTTTGAGCCT  
TCTATCGACTATGTTGTTACCAAGATCCCACGCTTTAACTTTGAAAAATTTGCGGGTGCCAACGACCGTTTGACC  
ACGCAAATGAAGTCTGTGGGTGAAGTCATGGCCATTGGCCGCACGCAGCAAGAATCACTGCAAAAAGCACTGCGC  
GGGCTGGAAGTGGGCGCGACCGGTTTTGACCCGAAAGTGAGCCTGGATGATCCCGAAGCACTGACTAAAATTCGT  
CGTGAACTGAAAGAAGCGGGTGCAAGCGTATCTGGTATATCGCTGATGCTTTCCGTGCGGGCATGTCCGGTTGAT  
GGTGTGTTCAATCTGACCAATGTTGATCGCTGGTTCCTGGTGCAGATTGAAGAGCTGGTTTCGTCTGGAAGAGAGC  
GTGGCAGAACTCGGTATCAACGGCTTGACTGCTGAATTTATGCGTCACCTGAAACGTAAAGGTTTTCGCCGATGCT  
CGTTTGCTAAATTGGTCGGTGCAAGCAGAAAGTGAAGTCCGTAACTGCGTTACAAATATGGTTTACACCCGGTT  
TATAAGCGTGTGATACCTGCGCGGCAGAGTTCTCGACGGATACGGCTTACATGTACTCCACCTACGAGGAAGAG  
TGCGAATCTAACCCAACAGCGATCGTCCGAAAGTGATGGTGCTGGGTGGCGGCCCGAACCGTATCGGACAAGGT  
ATTGAGTTCGACTATTGCTGCGTACACGCTTCATTGGCACTGCGTGAAGACGGTTACGAAACCATCATGGTGAAC  
TGTAACCGTGAGACGGTTTTCAACCGATTATGACACCTCTGATCGTCTCTACTTCGAGTCAGTCACGCTGGAAGAT  
GTGTTGGAATCGTCCGTATTGAGAAACCACAGGGCGTTATCGTGCAGTACGGTGGTCAGACACCGCTGAAATTA  
GCCCCGAGTTGGAAGCGGCTGGCGTCCCCATTATTGGGACCAGTCCGGATGCCATTGACCGTGCCGAAGACCGT  
GAGCGTTTTCCAGCAGGCGGTAAATCGTCTGGGCCTGAAACAGCCAGCGAATGCCACCGTAGCGACTATCGAGCAG  
GCGGTGGAAAAGCCACTGGTCTGGGCTATCCACTGGTCGTACGCCCTTCTTATGTGTTGGGTGGCCGCGCGATG  
GAAATCGTTTATGACGAGATTGACCTGCGCCGTTACTTCCAGAATGCCGTCAGTGTATCGAATGATGCGCCGGTA  
TTGCTTGACCGCTTCCTTGATGATGCCGTGCAAGTGATGTCGATGCCATTTGTGATGGTGAACGCGTGTGATC  
GGCGGCATTATGGAACATATAGAGCAAGCCGGGGTTCACTCTGGTGACTCAGCCTGTTTATTGCTGCTTACACC  
CTGAGCAAAGAAATTCAGGATGTGATGCGCCAACAAGTGGAAGAACTGGCCTTTGAACTCTGTGTCCGCGGCCCTG  
ATGAATGTGCAGTTTTCGGTGAAAAACAACGAAGTTTACCTGATTGAGGTTAACCCACGGGCGGCCCGTACTGTA  
CCTTTTCGTGTCCAAAGCGACCGGTATGCCACTGGCAAAAATTGCCGCTCGTGTGATGGTTGGCCAATCGCTGGCT  
GAGCAGGGCATGTTGGAAGAAATTATTCCGCCCTTACTACTCAGTCAAAGAAGTGGTACTGCCGTTTAAATAAATTC  
CCCGGTGTTGACCAATTTTAGGGCCAGAAATGCGCTCTACCGGTGAAGTCATGGGGGTTGGCCGTACCTTCGCT  
GAGGCGTTCTCTAAAGCGATGTTGGGCAGTCAATCTGGCATGAAAAAGAGTGGCCGTGCGCTATTATCCGTCCGT  
GAGGGGGATAAGCACCGGGTGGTAGACTTGCGGGCGAAGCTGCTAAAACAAGGCTTTGAACTGGATGCAACCCAC  
GGAACGGCGGTGCTGCTGGGCGAGGCGGGGATAAACCACGTTTTGGTTAACAAGGTGCATGAAGGCCGTCCGCAT  
ATTCAGGACCGTATTAAGAATGGCGAGTACACCTATATCGTGAATACCACAGCTGGGCGTCAGGCGATTGAAGAT  
TCTAAGCTGATCCGTGCGAGTGCTTTGCAATATAAAGTGCAATTACGATACGACCTTGAACGGTGGTTTTGCTACG  
GCGATGGCGTTAAATGCGGATCCAACCGATCAAGTGATTTCCGGTGCAAGAGATGCATGCCAAGATTAAGAATATG  
AAAGCGTAA

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**250. *Vibrio cholerae* (SEQ ID NO. 250)**

ATGCCAAAACGTACTGACATTCAAAGCATCCTTATCCTTGGTGCGGGTCCAATTGTTATCGGTCAGGCTTGTGAG  
TTTGACTACTCAGGCGCGCAAGCGTGTAAGCCCTGCGCGAAGAGGGTTACCGCGTTATTCTGGTTAACTCAAAC  
CCAGCGACCATCATGACTGACCCAGAAATGGCCGATGCGACTTACATCGAGCCTATCCACTGGGAAGTGGTGCGT  
AAGATCATCGAAAAAGAGCGCCCAGATGCGATTTTGCCACCATGGGCGGCCAGACTGCGCTGAACTGTGCGCTG  
GCACTCGAAAAACATGGCGTATTGGCTGAGTTTGGCGTTGAGATGATCGGCGCAACCGCCGATGCGATTGATAAA  
GCGGAAGACCGCTCACGCTTTGATAAAGCGATGAAATCAATCGGCCTAGAGTGTCTCGCGCTGATACCGCAAAA  
AGCATGGAAGAAGCGTACAAAGTCCTCGATATGGTTGGCTTCCCATGTATCATCCGTCTTCTTTACCATGGGC  
GGCAGCGGTGGTGGTATCGCTTACAACCGTGAAGAGTTTGAAGAAATCTGTACTCGCGGTCTGGATCTTTCACCG  
ACCAATGAACTGCTGATCGATGAATCACTGATTGGTTGGAAAGAGTACGAGATGGAAGTGGTGCGTGATAAGAAC  
GATAACTGCATCATCGTCTGTGCGATTGAAAACCTCGACCCAATGGGCATCCACACGGGTGACTCGATCACTGTC  
GCTCCAGCGCAAACGCTAACTGACAAAGAATACCAAATCATGCGTAACGCCTCTTTGGCGGTACTGCGTGAAATC  
GGCGTAGAAACCGGCGGTTCAAACGTTCACTTTGGTATCAACCCGAAAGATGGCCGCATGGTGATCATCGAGATG  
AATCCACGTGTATCGCGCTCTTCTGCGTTGGCTTCAAAGCCACCGGTTTCCCAATTGCGAAAGTGGCGGCCAAA  
CTGGCAGTGGGTTTCACTCTGGATGAGTTGATGAACGACATCACAGGCGGCGCAACACCAGCCTCGTTTCGAACCG  
ACCATCGACTACGTGGTCACTAAGATCCCTCGTTTCAACTTCGAAAAATTCGCCGGTGCCAATGACCGTCTGACT  
ACACAAATGAAGTCAGTAGGTGAGGTGATGGCGATTGGTCGTAACCAACAAGAATCACTGCAAAAAGCACTGCGC  
GGCTTGGAAGTGGGTGCGGCTGGTCTGGATGAGAAAGTGGATCTGGACGCGCCAGACGCTCTGACCAAAATTCGT  
TATGAGCTGAAAGAAGCAGGCGCAGAGCGTATTTGGTACATCGCGGATGCATTCCGTGCCGGTATGTCAGTGGAT  
GGGGTATTTAACCTGACCAACATCGATCGCTGGTTCCCTAGTGCAAATTGAAGAACTGGTGAAGCTGGAAGCCGAA  
GTGAAAGCCGGTGGCTTTGCGGGCTTGAACCAAGACGTAAGTGCCTAAGATGAAGCGCAAAGGCTTCTCTGATGCG  
CGTTTGTCAAACCTGCTCGGCGTGAGCGAAAACGAAATCCGTGCTCTGCGTGACCAATACAACATCCACCCAGTT  
TACAAGCGTGTGGATACCTGCGCGGCAGAAATTTAAGTCAGATACGGCTTACATGTACTCCACGTATGATGAAGAG  
TGTGAAGCCAATCCGACTGACAAAGACAAGATCATGGTGCTGGGCGGTGGTCCAAACCGTATCGGTCAAGGTATC  
GAGTTTGACTACTGCTGTGTACACGCCGCGCTTGCACTGCGTGAAAGATGGTTACGAAACCATCATGGTTAACTGT  
AACCCAGAAACCGTATCAACCGATTACGACACCTCAGATCGCCTCTACTTTGAGCCTGTAACCTCTAGAGGATGTG  
CTGGCTATCGTGCGTGTGAGAAGCCAAAAGGCGTGATCGTGCACTACGGCGGTCAAACACCACTGAAACTGGCG  
CGAGCGCTGGAAGCGGCTGGCGTACCTGTGATTGGTACCAGCCCAGATGCGATTGACCGCGCTGAAGACCGTGAA  
CGTTTCCAACAAGCGGTACAGCGTTTAGGCCTCAAACAGCCAGACAACGCAACCGTAACCGCTATCGAGCAAGCG  
ATTGAGAAGTCGCGTGAAATCGGTTTCCCACTCGTAGTTCGCCCCCTCTTATGTTCTGGGTGGCCGTGCGATGGAG  
ATTGTGTACGATGAGCAAGATCTGCGTCGTTACTTCAACGAAGCGGTGAGCGTGTGCAATGAATCACCAGTTCTG  
CTGGATCGCTTCCTTGATGATGCAACCGAAGTGGACGTGGATGCGATTTGTGACGGTGAGCGCGTGGTGATTGGC  
GGCATCATGGAGCACATTGAACAAGCGGGTGTTCACTCAGGTGACTCAGCCTGTTCTCTGCCGGCTTACACCTTG  
AGCCAAGAAATCCAAGACAAGATGCGTGAGCAAGTTGAGAAGTTGGCATTGAACTCGGTGTTCTGTGGCCTGATG  
AACATTCACTTTGCACTCAAAGACAACGAAGTTTACCTGATTGAAGTAAACCCACGTGCTGCGCGTACTGTGCCG  
TTTGTCTTCTAAAGCAACCGGTGCTCCGCTGGCGAAAATCGCGGCGCGCGTGATGGTTGGACAACTCTGGAGCAA  
CAAGGCTTCACCAAAGAGATCATTCACCTTACTACTCAGTTAAAGAAGTGGTTCTGCCGTTCAACAAGTTCCCG  
GGGGTTGACCCACTGCTTGGCCCTGAAATGCGCTCAACCGGTGAAGTGATGGGTGTGGGTGCCACGTTTGTGAA  
GCCTATGCTAAAGCAGAGTTGGGCTGTGGCTCGGTTTACCCTGAAGGTGGTTCGTGCGCTACTTTCCGTGCGTGAA  
GGTGACAAACAGCGTGTAGTGGATCTGGCTTCTAAGCTAGTGAAACTGGGTACCAGTTGGATGCGACTCACGGT

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ACTGCAGTGATTCTGGGCGAAGCGGGCATCAACCCACGTCTGGTTAACAAAGTGCATGAAGGTCGTCCACACATT  
CTGGATCGCATCAAAAACCACGAGTACACCTACATTGTGAACACGGCTTCTGGCCGCCAAGCAATTGAAGACTCA  
AAAGTACTGCGCCGTGGTGCATTGGCTCACAAAGTGAACCTACACCACCACACTGAACGCCGCCTTCGCAACTTGT  
ATGTCACACACGGCGGATGCCAAAGCATCCGTCACTTCAGTACAAGAGCTGCATGCGCGTGTAAAAGCGAACC  
GCTTAA

**251. *Vibrio vulnificus* (SEQ ID NO. 251)**

ATGCCAAAACGTACTGACATTCAAAGCATTCCTTATCCTAGGTGCTGGTCCAATTGTTATCGGTCAGGCTTGTGAG  
TTTGACTIONCAGGCGCACAAAGCATGTAAAGCGCTACGTGAAGAAGGTTACCGAGTTATCCTAGTAACTCGAAC  
CCAGCGACCATCATGACAGACCCAGATATGGCGGATGCGACCTACATCGAGCCAATTCAATGGGAAGTGGTACGC  
AAGATTATCGAAAAAGAGCGTCCAGATGCGGTTCTACCAACCATGGGTGGTCAGACGGCTCTAAACTGTGCGCTT  
GCGCTTGAAAAGCACGGCGTGCTAGCGGAATTTGGCGTAGAAATGATCGGTGCAACTGCTGATGCCATCGATAAA  
GCGGAAGACCGTTTCGCGTTTCGACAAAGCGATGAAATCTATCGGCCTAGAGTGTCTCGTGCTGATACGGCGAAG  
ACCATGGAAGAAGCGTACAAAGTGCTCGATATGGTTGGCTTCCCATGTATCATCGCCCCGTCATTACCATGGGT  
GGTACGGGGGGGGTATCGCGTACAACAAAGAAGAGTTCGAAGAAATCTGTCGCCGTGGTCTTGACCTGTGCGCA  
ACCAATGAAGTGTATCGATGAATCTTTGATCGGTTGGAAGAGTACGAAATGGAAGTGGTTCGCGACAAAGCG  
GACAACTGTATCATCGTATGTTCAATCGAAAACCTTCGACCCAATGGGCATCCACACCGGTGACTCTATCACCGTG  
GCACCGGCTCAAACGCTGACAGATAAAGAATACCAACTGATGCGTAATGCGTCGCTAGCGGTACTTCGTGAAATC  
GGTGTAGAGACAGGTGGTTCAAACGTGCAGTTTGGTATCAACCCGAAAGATGGCCGTATGGTTATCATCGAGATG  
AACCACGTGTATCGCGCTCTTCTGCTCTAGCGTCAAAAGCGACAGGTTTCCCTATTGCGAAGATTGCAGCGAAA  
CTAGCCGTTGGCTTCACGCTTGATGAGCTACAAAATGACATCACTGGTGGTGCACGCCAGCATCATTTGAACCG  
ACCATCGACTACGTAGTACTAAGATTCCTCGTTTCAACTTCGAGAAATTTGCCGGTGCTAACGACCGTTTGACG  
ACGCAAATGAAGTCAGTTGGTGAAGTATGGCCATTGGCCGTAACCAACAAGAATCACTGCACAAAGCGCTGCGC  
GGTCTAGAAGTGGGCGCGACTGGTTTTGATGAGATGGTTGATCTTGATTCACCAGATGCACTGACCAAAATTCGC  
CACGAGCTGAAAGAAGCGGGCGCTGAGCGTATTTGGTACATTGCCGATGCATTCCGTGCGGGTATGTGAGTTGAT  
GGTGTGTTTAACTAATAACATCGATCGCTGGTTTCTGGTTCAAATCGAAGAGATTGTGAAGCTGGAAGAGCAA  
GTGAAAGCGGGTGGTTTTGCTGGTTTAACTCAAGATGTGCTTCGTCAAATGAAGCGTAAAGGTTTTCTCCGACGCT  
CGCCTATCAAACTACTCGGCGTGGCTGAAAGTGAATCCGTCTACGTGACCAATTCGACATCCACCCTGTA  
TACAAGCGTGTGATACCTGTGCGGCAGAAATCTCATCGGATACGGCTTACATGTACTCATCTTATGATGATGAG  
TGTGAAGCGAACCACCGATAAAGAAAAGATCATGGTTCTGGGCGGTGGTCCAAACCGTATCGGTCAAGGTATT  
GAGTTTGACTACTGCTGTGTACACGCTTCGCTAGCGCTACGTGAAGATGGTTACGAGACCATCATGGTGAAGTGT  
AACCAGAAACCGTATCAACCGACTACGACACTTCAGACCGTCTCTACTTTGAACCGTTACTCTAGAAGATGTG  
TTGGCGATTGCTCGTGTTGAAAAGCCAAAAGGCGTGATCGTGAGTACGGTGGTCAAACCTCACTGAAACTGGCG  
CGTGCGCTAGAAGCGGCGGGTGTACCAATTATCGGTACTAGCCCTGATGCCATCGACCGTGCGGAAGACCGTGAG  
CGTTTCCAACAAGCGGTTGACCGCTTAGGCCTGTACAGCCAGAGAACGCAACCGTAACCACCATGGAGCAAGCG  
GTTGAGAAGTCGCGTGAAATTGGCTTCCCATTTGGTCGTTTCGTCCATCTTACGTACTGGGTGGCCGCGCTATGGAA  
ATCGTTTATGACGAGCAAGACCTACGCCGCTACTTCAACGAAGCGGTTAGCGTGTGCAACGAATCACCGGTTCTA  
CTGGATCGCTTCCCTAGACGATGCAATTGAAGTCGATATCGACGCTATCTGTGACGGTGAGCGCGTGGTGATTGGC  
GGTATCATGGAGCACATCGAGCAAGCGGGTGTTCCTCAGGTGACTCAGCATGTTCACTGCCTGCTTACACGTTA  
AGCCAAGAAATCCAAGACAAGATGCGTGAGCAAGTTGAAAAGCTGGCATTGAGTTGGGCGTTTCGTGGCCTAATG

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AACACGCAGTTT GCCGTAAAAGACAACGAAGTGACCTCATCGAAGTGAACCCCTCGTGCTGCACGTACCGTTCCA  
TTCTGATCGAAAGCGACCGGTGCACCACTTGCGAAAATCGCAGCACGTGTTATGGCTGGTCAGTCTCTGGAATCG  
CAAGGTTTCACCAAAGAGATTATTCCTCCTTACTACTCGGTAAAAGAAGTGGTTCTGCCATTTAACAAGTTCCTT  
GGCGTTGACCCACTATTGGGCCCTGAAATGCGCTCAACGGGTGAAGTGATGGGTGTAGGTGCAACTTTTGCTGAA  
GCGTATGCGAAAGCAGAACTGGGTGTGGCAATGTGTATCCTGAAGGTGGTCGTGCGCTGCTTTCGGTACGCGAA  
GGCGACAAGCAACGTGTGGTTGACCTAGCGTCTAAATTACTGAAACTAGGGTACAAGCTGGATGCGACACACGGT  
ACGGCAGTGATCTTAGGTGAAGCGGGCATCAACCCACGTCTAGTAAACAAAGTGCACGAAGGTGTCCTCACATT  
CTTGACCGCATCAAGAACAACGAATACACCTACATCGTGAACACGGCGGCTGGTCGTCAAGCGATTGAAGATTGCG  
AAAGTTCTACGCCGTGGCGCACTTGCGAAAAAGTGAACACACCACGACACTTAACGCGGCATTTGCGACCTGT  
ATGTCTCATACGGCGGACGCGAAAGCAAGCGTGACGTGGTACAGGAAGTGCACGCGCAAGTGCAAGCGAGTTTG  
AAAGCGTAA

**252. *Vibrio parahaemolyticus* (SEQ ID NO. 252)**

ATGCCAAAACGTACTGACATTCAAAGTATTCTAATTCTTGGTGCTGGTCCGATTGTTATCGGTCAGGCATGTGAG  
TTTGACTACTCTGGCGCACAAGCGTGTAAGCTCTTCGTGAAGAAGGCTACCGAGTTATTCTAGTTAACTCTAAC  
CCAGCAACCATCATGACAGACCCTGAAATGGCAGATGCAACTTACATCGAGCCGATTCAATGGGAAGTTGTTCCG  
AAGATCATTGAGAAAAGACGCCAGATGCAGTATTGCCAACAATGGGTGGTCAGACGGCGCTTAACTGTGCGCTA  
GATCTAGAGAAGCACGGCGTTCTTGCTGAATTCGGCGTAGAGATGATTGGCGCAACGGCTGACGCGATTGATAAA  
GCAGAAGACCGTTCTCGCTTCGATAAAGCAATGAAGTCTATCGGCCTTGAGTGTCTCGTGCTGATACCGCGAAG  
ACGATGGAAGAAGCTTACAAAGTTTGTAGACATGGTTGGCTTCCCTTGATCATCCGTCCATCGTTCACCATGGGT  
GGTACGGGTGGCGGTATCGCGTACAACAAAGAAGAGTTTGAAGAAATCTGTCTCGTGGTCTGGATCTTTCTCCG  
ACTAACGAACTTCTTATCGATGAATCGCTAATCGGTTGGAAAGAGTACGAAATGGAAGTAGTTCGCGACAAAGCG  
GACAACTGTATCATCGTATGTTCAATCGAAAACCTTCGACCCAATGGGCATCCACACCGGTGACTCAATCACGGTT  
GCTCCAGCGCAAACTCTGACTGACAAAGAATACCAGCTAATGCGTAATGCATCGCTAGCGGTTCTGCGTGAAATC  
GGTGTGAGACAGGTGGTTCAAACGTACAGTTTGGTATCAACCCGAAAGATGGCCGTATGGTTATCATCGAGATG  
AACCACGTGTATCTCGCTCTTCTGCTCTGGCATCAAAGCAACAGGTTTCCCAATCGCTAAGATTGCGGCGAA  
CTGGCTGTTGGCTTTACTCTAGACGAGCTGCAAAACGACATTACAGGTGGTGCAACTCCGGCATCATTCGAACCT  
ACTATCGACTACGTAGTGACCAAGATTCCCTCGTTTAACTTCGAGAAATTTGCTGGCGCTAACGATCGACTGACG  
ACTCAGATGAAGTCAGTTGGTGAGGTAATGGCGATTGGTCGTAACCAACAAGAATCTCTTACAAAGCATTACGT  
GGCCTAGAGGTTGGCGCGACTGGCTTTGATGAGATGGTTGACCTAGATGCACCTGACGCATTAACCTAAGATTCGT  
CACGAACTAAAAGAAGCTGGCGCAGAGCGTATCTGGTATATCGCAGATGCATTCCGTGCGGGCATGTCTAGTGGAT  
GGCGTGTTTAACTGACGAACATTGATCGCTGGTTCCCTAGTTCAAATTGAAGAGCTAGTTAACTAGAAGAGCAA  
GTGAAAGCCGGTGGCTTTGCTGGTCTAACAGAAGAAGTTCTACGCCAGATGAAACGTAAAGGTTTCTCTGATGCT  
CGCCTATCTAACTGTTAGGTGTGGCGGAAAGCGAAATCCGTGCTCTACGTGACAGTTTGACATCCACCCTGTC  
TACAAGCGAGTGATACGTGTGCGGCTGAGTTCTCTTCTGATACGGCTTACATGTACTCATCTTACGATGAAGAG  
TGTGAAGCAAACCCAACAGATAAAGACAAGATCATGGTACTGGGCGGTGGTCCAAACCGTATCGGTCAAGGTATC  
GAATTCGACTACTGTTGTGTACATGCATCACTAGCGCTTCGTGAAGATGGCTACGAAACCATTATGGTGAAGTGT  
AACCAGAAACAGTATCGACAGACTACGATACATCTGACCGTCTTTACTTCGAACCAGTAACTCTTGAAGATGTG  
TTGTCTATCGCCGCGTTGAAAAGCCAAAAGGTGTGATTGTTCAATACGGTGGTCAAACGCCACTTAACTGGCT  
CGCGCACTAGAAGCTGCAGGCGTGCCAATCATCGGTACAAGCCCGGATGCGATTGACCGCGCAGAAGACCGTGAG



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CGTTTCCAGGCTGCAGTTGAGCGTTTAGGTCTTCTACAACCACAAAACGCAACAGTAACGGCGATGGAGCAAGCG  
GTTGAGAAATCTCGTGAAATCGGCTTCCCACTCGTTGTTTCGTCCATCTTACGTTTTGGGTGGTCGTGCGATGGAA  
ATCGTCTACGATGAACAAGACTTGCGTCGTTACTTCAACGAAGCAGTAAGCGTATCGAATGAATCTCCAGTTCTA  
CTAGACCGATTCTTAGATGATGCAACAGAAGTGGATATCGACGCTATCTGTGACGGTGAGCGCGTGGTTATCGGC  
GGCATCATGGAGCACATTGAGCAAGCGGGCGTTCACTCTGGTGA CTCTGCATGTTTCGCTTCCTGCTTATACACTA  
AGCCAAGAAATCCAAGACAAGATGCGTGAGCAAGTTGAGAAGCTGGCGTTTGAACCTTGGTGTACGTGGCCTGATG  
AACACGCAGTTTGCTGTAAAAGACAACGAAGTTTACCTAATTGAAGTAAACCCCTCGTGCTGCGCGTACGGTACCA  
TTCGTATCGAAAGCGACAGGCGCACCCTAGCGAAAATCGCGGCACGTGTAATGGCGGGTCAATCTCTGGAATCA  
CAAGGTTTCACTAAAGAGATTATTCCTCCTTACTACTCAGTCAAAGAAGTCGTTCTACCTTTCAATAAGTTCCCT  
GGCGTTGACCCTCTATTAGGTCTGAAATGCGCTCAACAGGTGAAGTGATGGGTGTTGGTGCTACGTTTGCAGAA  
GCTTACGCAAAAGCAGAGCTTGGCTGTGGCAGTGTGTACCCTGAAGGTGGTCGTGCGCTACTTTCTGTTTCGTGAA  
GGTGATAAGCAGCGTGTTGTTGACCTTGCCTAAGCTAGTAAAATTGGGTACCAATTGGATGCGACTCACGGT  
ACTGCTGTAATCCTTGGTGAAGCGGGTATTAACCCTCGCCTGGTAAACAAAGTACATGAAGGTCGTCCACACATT  
CTTGACCGCATCAAGAACAACGAATACACCTACATTGTGAACACGGCTGCAGGTTCGTCAAGCTATTGAAGATTTCG  
AAAGTTCTACGCCGCGGTGCTCTAGCAGAAAAAGTGAAGTACACAACAACGCTAAACGCTGCGTTTGCAACGTGT  
ATGTCTCACACTGCTGATGCAAAAGCGTCAGTAACTTCTGTTTCAGGAGCTACACGCTAAAGTAAAAGCGAGTCTG  
GAAGCGTAA

**253. *Vibrio fischeri* (SEQ ID NO. 253)**

ATGCCAAAACGTACTGATATTAAGCGTTCTAATTCTAGGTGCCGGTCCAATTGTAATCGGCCAAGCATGTGAA  
TTTGACTACTCTGGTGCACAAGCATGTAAAGCACTTCGTGAAGAAGGCTACCGTGTTATTCTTGTGAAGTCTAAC  
CCAGCAACAATCATGACTGACCCAGACATGGCTGATGCAACGTACATTGAACCAATTCATTGGGAAGTGGTTCGT  
AACATCATCGAAAAAGAGCGTCCAGATGCGGTATTACCAACAATGGGTGGTCAAACAGCATTAAACTGTGCGCTT  
GATTTAGAAAAGCACGGTGTCTTGTGCTGAATTCGGTGTGAGATGATTGGTGCAACAGCTGATGCAATTGATAAG  
GCGGAAGACCGTTCTCGTTTTGATAAAGCGATGAAGTCTATTGGACTTGAGTGTCCACGTGCTGATACAGCAAAA  
ACCATGGAAGAAGCTTACGGCGTTCTAGATATGGTTGGTTTTCCCATGTATTATTTCGTCCATCATTTACGATGGGT  
GGTACGGGCGGTGGTATCGCATAACAAGAAGAGTTCGAAGAAATTTGTCGTCGCGGTTTAGACCTTTCGCCA  
ACTAACGAGCTTCTAATCGATGAATCATTAATCGGTGGAAAGAGTACGAGATGGAAGTGGTTCGTGATAAGAAC  
GATAACTGTATCATCGTATGTGCAATTGAAAACCTTTGATGCGATGGGTATTCACACTGGTGA CTCAATCACGGTT  
GCGCCAGCACAAAACGCTAACGGATAAAGAATACCAACTAATGCGTAATGCATCTCTAGCTGTACTGCGTGAGATT  
GGTGTGTAACGGGTGGCTCAAACGTACAGTTTGGTATTAACCCGAAAGATGGTCGTATGGTTATCATCGAAATG  
AACCACGAGTATCTCGTTCATCTGCACCTTGCTTCTAAAGCAACAGGTTTCCCTATTGCAAAAATTGCAGCGAAA  
TTGGCTATTGGCTTTACGCTTGACGAGCTAATGAATGACATTACAGGTGGGGCAACGCCTGCGTCATTTGAACCA  
ACAATCGATTACGTTGTTACTAAGATCCCTCGTTTTAACTTCGAAAAATTTCGAGGGGCTAACGATCGCCTAACA  
ACACAGATGAAATCAGTTGGTGAAGTGATGGCTATCGGCCGTAACCAACAAGAATCTCTACAAAAAGCACTTCGT  
GGCCTAGAAAGTAGGTGCGACTGGTTTTGATGAGATGGTTGATTTAGATGCTCCTGATGCATTAACAAAAATTCGT  
CATGAACTGAAAGATGCTGGTGCTGAGCGTATTTGGTACATCGCTGATGCGTTCGTCGCGGTATGTCTGTTGAT  
GGTGTGTTAATCTAACGAATGTTGATCGTTGGTTCCTAGTTCAAATTGAAGATTTAGTAAAAGAAGAAGCGG  
GTTAAAGCGGGTGGTTTTGCTAATTTAACCGCAGATGCACTTCGTAACTTAAGCGTAAAGGTTTTGCTGATGCG  
CGTCTTTCTAAACTATTGGGCGTTGGTGAGAGTGAAATTCGTGCGCTGCGTGACCAGCATGATATTCACCCTGTA

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TACAAGCGTGTAGATACGTGTGCTGCTGAGTTCTCATCAGATACGGCTTACATGTACTCATCTTATGATGAAGAG  
TGTGAAGCAAATCCAACAGACAAAGATAAGATCATGATCTTAGGTGGCGGTCCAAACCGTATCGGTCAAGGTATT  
GAGTTTGATTACTGTTGTGTACACGCATCATTAGCACTACGAGAAGATGGCTACGAAACTATCATGGTTAACTGT  
AACCCTGAGACTGTTTCTACGGATTACGATACGTCTGACCGTCTATACTTCGAACCAGTTACTCTAGAAGATGTA  
CTAGCAATTGCTCGTGTGAGAAACCAAAAGGCGTGATAGTTCAGTACGGTGGTCAAACCTCCACTTAACTGGCT  
CGCGCTCTTGAAGCAGCTGGTGTTCGAATCATAGGTACAAGCCCTGATGCTATCGACCGTGCAGAAGACCGTGAG  
CGTTTCCAAGTTGCTGTGCGACCGTTTGGAGCTTCTTCAACCAGAAAATGCAACGGTTACTACAATGGAGCAGGCG  
ATTGATAAATCAAAAGAAAATCGGCTTCCCACTCGTAGTACGTCTTCTTATGTTCTTGCTGGTCGTGCGATGGAA  
ATCGTATATGACGAGCAAGACTTACGTCTTACTTCAATGAAGCAGTAAGCGTATCAAATGAATCTCCAGTACTT  
CTTGATAGCTTCTTGATGATGCTGTAGAAGTGGATGTTGATGCGATTTGTGACGGTGAGCAAGTGGTTATCGGC  
GGTATCATGGAGCACATCGAGCAAGCGGGTGTTCCTGCTGACTCAGCATGTTCTCTTCTGCTTATACATTA  
AGCGAAGAAAATCCAAGATGTAATGCGTGATCAAGTACGTAAGCTGGCATTTCGAGCTAGGTGTTCTGCTGGCTTAATG  
AATACACAGTTTGCTGTTAAAGATAACAAAGTATACCTAATCGAAGTTAACCACGTGCTGCTCGTACGGTTCCA  
TTCGTATCGAAAGCAACTGGTGCACCATTAGCTAAGATTGCAGCGCGTGTAATGGCGGGTCAATCTCTAGAGTCT  
CAAGGCTTTACTAAAGAGATCATCCCACCATACTACTCAGTTAAAGAAGTGGTATTACCGTTCAACAAATTCCT  
GGTGTGACCCACTGTTAGGCCCAGAAATGCGCTCAACGGGTGAAGTTATGGGTGTTGGTACAACGTTTGCTGAA  
GCATTTGCTAAAGCTGAACCTGGCTGTAGCAAAGAATACCCAGAAGGTGGTTCGTGCATTACTTTCTGTTCTGTA  
GGTGATAAGAAACGTGTTGTAGATTTAGCAAACATCTTGTTAAATTGGGTACCAACTGGATGCAACTCACGGT  
ACAGCAGTTATTCTTGGCGAAGCGGGTATTAACCCACGTCTAGTAAACAAGGTACATGAAGGCCGTCCTCATATT  
CTTGACCGTATCAAGAATGGTGAGTACACCTACATCGTTAATACTGCAGCAGGTTCGTCAAGCGATTGAAGATTCT  
AAAGTATTACGTCTGTTGGTGCCTAGCTGAGAAAGTAACTACACAACAACGCTAAATGCAGCATTTGCTAGTTGT  
TTAGCTCATGAAGCGGATGACCGTAAAACGGTTAACTCTGTTCAAGAGCTACACGCTAAAGTGGCAGCTAAATAC  
GCTTAA

**254. *Campylobacter jejuni* (SEQ ID NO. 254)**

ATGCCAAAACGAACAGATATTAAAAGCATTTTACTTATAGGAAGTGGTCCTATTGTGATAGGACAAGCTTGTGAA  
TTTGATTATTCTGGAACCTCAAGCCGCAAAGACTTTAAAAGAATTAGGATATCGTGTAGTATTAATCAACTCAAAT  
CCTGCAACCATCATGACAGATCCCGAATTTGCAGATGCGACTTATATAGAACCATAACAAAAGAAAGTATTTTA  
AGTATTATTAAAAAAGAAAAAATTGATGCAATTTTGCCAACTATGGGTGGACAAGTAGCGTTAAATGTTGCTATG  
GAAGTTTATGAAAGCGGACTTTTAGGAGATGTGAAATTTTAGGCGCAAATCCTGAGGCGATTAAAAAAGGCGAA  
GATCGTCAGGTTTTTAAAGAATGTATGAAAAAATTGGCATGGATTTGCCAAAATCGATGTATGCGTATAATTAT  
GACGAAGCTTTAAAAGCCGTAGATGAAATCGACTTTCCTTTGATGATCCGTGCTTCTTATACTTTAGGGGGTGCT  
GGAAAGTGGTGTGGTTTACAATATGGACGAATTTAAAGAAGTTACCAATACTGCTTTAGCTTTATCACCTATTCAT  
GAAATTTTGATTGAAGAAAGTTTGTTAGGTTGGAAAGAATATGAAATGGAAGTTATACGCGATAGAGCGGATAAT  
TGTATCATAGTTTGTAGCATAGAAAATATCGATCCTATGGGAGTTTCATACAGGAGATAGTATTACAATAGCTCCA  
GCATTAACCTTTGACAGATAAAGAATATCAAGTTATGCGTAATGCTTCTTTTGCTATTTTGCCTGAAATTGGTGTA  
GATACAGGCGGAAGTAATGTGCAATTTGCTATCAACCCAAAAAATGGAAGAATGATAGTTATAGAAATGAATCCA  
AGAGTTTCAAGATCAAGTGCTTTAGCTTCTAAGGCAACGGGTATCCTATAGCAAAGTTGCGACACTTTTGGCA  
GTAGGTTTTAGCTTAGATGAGATTAAAAATGATATTACAGGAACCTGTCATCTTTCGAGCCTGTGATTGATTAT  
ATTGTAACAAAAATTCCTCGCTTTACCTTTGAAAAATTTCCAGGAGCAAATACAACCTTTAGGTACAGCTATGAAA

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AGTGTGGGTGAGGTAATGGCTATAGGACGCACTTTTAAAGAAAGTATACAAAAAGCACTTTGTTTCGCTTGAGCGT  
TCTTTAAGTGCTTTTGATAGGGTAAAATTTGAAGATAGAAATGATCTTGTTTTTAAAATTCGCAATGCCAATGAA  
AAGCGTTTACTTTATGTTGCTCAAGCTTTTAGGGAAGTTTTAGCGTAGAAGAACTTTATGAGCTTTGTAAAATA  
GATCCTTGTTTTTAAACACAGATTAAAGAAATTGTAGATTTTGAAGAACAAATTGATATGGATATTTTAAACAAT  
AAGGCTCTTTTGAGAAAAGCAAAAACCTATGGGCTTTTCAGATAAAATGATAGCCTTGCTTGTAATTTGAAAGAT  
AATTTAGAATTAAGCCAAAATGATATTTATTATGTAAGAATGAAGCAAAAAATCATCGCAGAATTTAGTGAAGTG  
GATACTTGTCGGGTGAATTTGAAGCCTTAACCTCTTATCTTTATTCAAGTATCAATGTAAGCGAACTCACTCAA  
AGTAAAAACGATGCTAAGGATAAAAAAGAAAAAAAGTGATGATTATAGGTGGGGGGCCAAACCGTATAGGACAA  
GGTATAGAATTTGACTATGCTTGCGTACATGCTTCTTTTGCGCTTAAAGATATGGGTATTAAAACTATTATGTAT  
AATTGTAATCCTGAAACCGTTTCGACTGACTATGATACAAGTGATATTTTGATTTTCGAGCCTATTGATTTCGAA  
CATTTAAGAGCGGTGATTGAGCGTGAAAAACCTGATGGAGTGATTGTGCATTTTGGTGGACAAACTCCTTTGAAA  
TTTGCTAAGCGTTTAAAGTGCTTTTGGAGCTAAGATTATAGGTACTAGCGCAAGAGTAATTGATATGGCAGAAGAT  
AGAAAGAAATTTGCCGAATTTATTACAAAGCTAGGTATCAATCAGCCAAAAAATCTACTGCAACAAGCGTAGAA  
GAAGCGGTTCTTAAGGCTAGTGATATAGGGTATCCTGTGCTTGTAAGACCAAGTTATGTTTTAGGTGGGCGTGCG  
ATGCGCGTGGTAAATGATGAGGCTGAACCTTAGACTCTATATGCAAGAAGCTGTGGATGTAAGCGATAAAAGCCCT  
GTTTTGATCGATCAGTTTTTAGACAATGCTACAGAAATTGATGTTGATGCGATTTGTGATGGCAAAGATGTTTAT  
GTTGCAGGAATTATGGAGCACATAGAAGAAGCAGGAATTCATTTCGGGTGACAGTGCTTGTTCTTTGCCGCCCTTGC  
AATATCGATGAAAAAATGCAAGAATTTATTGCACAAAAAACCGCAGATATTGCTTTAAATTTGGGAGTTGTAGGA  
CTTTTAAATATACAATTTGCTTTACATAATAATGAGCTTTATATGATAGAGGTAAATCCTAGAGCTAGTCGTACC  
ATACCTTTTGTTAGTAAAGCTACGGGTATTTCCTTTAGCAAAAGTGGAACGCGTGATGTGGCAAGGAAATTTA  
AAAGAAGCTTTAAAATTTTATGATACTTTTAAAGTGGTTAATTTTGATACTAAAATTTTACGCCCTAAAACCTCCA  
AAATATATGAGCGTGAAAGAAGCAGTATTTCCATTTGCAAACTTAGTGGAAGTGATTTAGAATTAGGTCTTGAA  
ATGCGTTCAACGGGTGAAGTTATGGGTATAAGCAAGGATTTTGCAATTCCTTATGCGAAAAGTCAAATTCATCG  
TTAATCATCTTCCAGAGCAAGGCGTGGTATTTATCTCCTTAAAAGATAAGGATAAAAAATATACCAAAAAATC  
GCTGCAGAATATGTAAAGCTTGGCTTTAAGCTTATGGCAACAGGGGGAACCTTGCAAGGAAATTTTAGAAAGTGGT  
TTTGAGTGCGAACTTGTAACATAAAATTTTCAAGAGGACGCCCCAATGTTGAAGATAAATTGAAAAATGGAGAAAT  
CACTTAGTTATCAATACAAGCGATAGTCACAGTTTTTAAAGGCGATACGAAAAAATTCGTGAAAATATTATTCGT  
TTTAAATACCTTATTTTACAAATTTACGATCAGCTTTAGCAGGTGCAAAATCGATTAAAGCTATACAGAGTAAA  
TCTTGCCTAGATGTAAAGAGTTTGCAAGAGTGGCTTAAATCTTGA

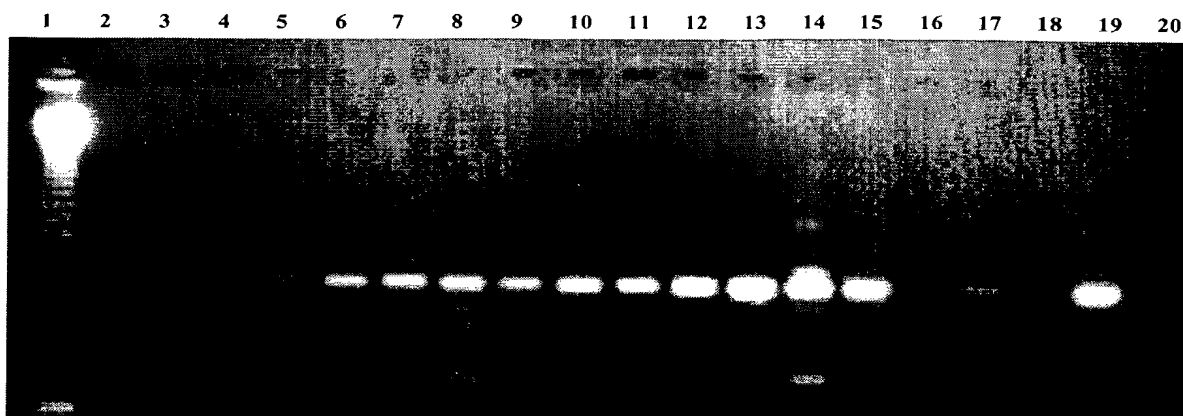
**255. *Corynebacterium diphtheriae* (SEQ ID NO. 255)**

ATGCCAAAGCGCAATGACATCAAACACGTCCTGGTTATCGGTTCCGGTCCAATCGTTATCGGACAAGCGTGTGAG  
TTTGAATATTCCGGAACACAAGCGTGCCGAGTTCTTAAAGAAGAAGGACTTCGCGTCACTTTGATCAACTCGAAT  
CCGGCGACAATCATGACGGATCCAGAGTTTGCTGATCATAATATGTTGAGCCGATTGAGCCGGAATATATTGAA  
AAGATTTTTGAAAAAGAGATCGCTGAGGGACACCCCGTTGATGCTGTCTTGGCAACACTTGGTGGGCAAACGGCA  
TTGAATGCCGCTATCAAATTAGATCGTCGCGGATCTCTCGAAAAATACAACGTAGAACTCATCGGTGCAGACATC  
GACGCCATTGAGCGCGGCGAGGACCGCCAGAAATTCAAAGATATCGTTGCGAAAATTGGCGGCGAATCAGCGCGT  
TCCCGTGTATGCCACAATATGCAAGAGGTATATGACACCGTTGAAGAGCTCGGCCTTCCGGTAGTTGTACGCCCT  
TCCTTCACTATGGGCGGTTTGGGGTCCGGACTTGCTTCAATCAAGAGGATCTCGAACGAATTGCCGGCGGTGGA  
CTCGCAGCGTCTCCCGAAGCAAACGTGCTTATTGAAGAATCAATTCCTGGCTGGAAGAATATGAGCTTGAGCTC

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ATGCGTGATGGTGCTGATAACGTTGTGGTTATTTGTTCCATTGAAAATGTTGATGCACTAGGCGTACACACAGGT  
GATTCTGTTACTGTGCGACCTGCTTTGACTCTGACTGATCGTGAATACCAAAGATGCGTAATCAAGGCATCGCG  
ATTATTCGTGAAGTAGGGGTCGACACCGGTGGATGTAACATCCAATTTGCGGTAAATCCACGTGATGGTCGTTTG  
ATCACCATTGAGATGAATCCTCGTGTATCTAGGTCATCCGCCCTTGTCATCGAAAGCAACGGGATTCCCCATCGCT  
AAGATTGCTGCCAAGTTGGCTATCGGATACACGCTGGATGAAATTACTAATGACATCACCGGTGTTACGCCGGCG  
GCTTTCGAGCCAACGCTCGATTACGTAGTAGTCAAGTCTCCGCGCTTTGCGTTTGAGAAGTTCACAGGATCCGAC  
GACACATTGACTACAACGATGAAGTCCGTTGGTGAGGCAATGGCTCTTGCCGTAATTACATCGCGGCGTGGGT  
AAAGTCATGCGTTTCGCTAGAAAACAAGCAAGTTGGTTTCTGGACAACAAGTGATGAATTCCTTGCTGGGGATCGC  
GCTAAGAATCTTGACGCAGTGTTAGAAGATCTGAAACGCCCGACAGAAGGGCGGATGTATGACGTGGAGCTGGCT  
CTTCGCCTTGCGGCTCAATTGAAGAAGTACATCAAGCGTCTGGGCTTGATCCATGGTTCTTGCGGAGCTTCAG  
TCATTAATAGATTTCCGAGAATCCTTGATGAAGGCACCGGTGCTGGATGAGCCGTTGCTTCGAAAAGCCAAATTC  
TTCGGATTGTCTGACCGCCAAATCGCGGCCCTTCGTCCCGAATTTGCAGGGGAAGACGGCGTTTCGTGCTTGCGA  
TGGTCAATTGGGAGTACGGCCAGTATTTAAGACTGTAGATACGTGCGCTGCAGAATTTGAAGCTACGACTCCATAC  
CATTATTCAGCATATGAACTCGATCCAGCTGCTGAATCGGAAGTACGTCCTCAAACGAAAAAGACAAGATCATC  
ATTTTGGGATCAGGTCCGAACCGAATTGGCCAAGGTATTGAGTTTGACTACTCATGTGTTTCATGCTGCGCTCGAA  
CTTTCACGCGTGGGGTATGAGACAGTTATGGTTAACTGCAACCCAGAAACCGTGTGACAGATTATGACACCGCT  
GACCGTCTGTATTTGAGCCACTGACATTTGAAGATGTTATGGAGGTCTACCACGCCGAATCAGAATCTGGACAT  
GTTGCCGGTGTGATCGTTGAGCTTGCGGACAAACTCCACTTGAGCTAGCCGAAAAGCTTCGTGATGCGGGTGTC  
CCGGTCATTGGTACTACTCCAGAGGCTATCGATCTAGCTGAAGATCGAGGAGAATTCGGTGAAGTATTGCGTAAA  
GCGCAATTGCCAGCTCCAGCTTTTCGGTACCGCTACATCATTTGAGGAAGCTAAAACGTTGCCAATAACATTGGT  
TACCCAGTATTAGTTCGTCCATCTTACGTCTTGCGCGGCCGTGGCATGGAAATCGTATACGACGAAAATTCCTTG  
CACGCGTACATCGAGCGAGCTACCGAGATCACGAGTGATCACCCAGTGCTCGTGGATCGCTTTTGTAGATAATGCG  
ATTGAAATTGACGTTGATGCGCTTTGTGATGGCGAAAATGTCTACCTTGCTGGTGTATGGAACACATTGAAGAA  
GCTGGTATTCACCTCCGGTGACTCTGCTTGTGCGCTGCCACCTATGACGCTAGGTGCCGAAGATATCGAAAATGTC  
CGTCGCTCAACAGAAGCGTTGGCACATGGTATCGGCGTTAAAGGATTGATGAATGTTCAATATGCCTTGAAGGAT  
GACATTCTTTATGTGATTGAGGCCAACCTCGTGATCTCGTACAGTGCCTTTTGTCTCCAAAGCTACGGGTGTC  
CACTTAGCAAAAGCAGCAGCGCAATCATGACTGGGGCAACGATTCCTGAGCTTCAAGCGGAGGGAATGATTCCA  
ACCGGTTACGATGGTGGTTCTTTGCCAGAGAATTCGCCGATTGCGGTGAAGGAAGCAGTACTTCCGTTCAATCGA  
TTCCGTCGTCCTGATGGCACAATGTTGGATACTTTGCTAAGTCTGAGATGAAATCAACGGGCGAAGTCATGGGG  
CTGGCTGATAATTTTGGTGCTGCATATGCTAAGGCAGAACAGGCGGCTTTTGGTGCACTTCCAACTGAAGGCACT  
GTCTTCGTATCAGTAGCAAACCGCGATAAGCGTACTTTGATTTTCCCAATTCAGCGCCTAGCTTCACTTGGATTC  
CGAGTACTGGCAACATCAGGCACAGCCGGAATGCTACGTGCGCAATGGTATTGAATGCGAAGTTGTATTGAAGCAG  
ACCCAAGTGCAGGAAGCACGACAAAACGGCACTGAGGGGCAGCGTTCCGTAGTGGATATGATTAAAGCCGGCGAG  
GTGGACCTCATTCCTTAATACACCTGCAGGGTCTTCAGGAGCGCGTCACGACGGTTACCAGATTCGCGCAGCGGCA  
GTCAACGTTGGCGTTCCCTCTGGTTACTACCGTGCAAGGTGTTACTGCGGCAGTACAGGGAATCGAAGCGCTTAGG  
GCTGGTGAGCTCAGCGTTCGAGCGCTGCAAGAGCTAGATCATTCGGTGACTCGATGA

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**Figure 10. Amplification of molecular marker VI (pgi) in Gram-negative bacteria**

1. DNA Ladder (123 bp)
2. *Pseudomonas aeruginosa*
3. *Pseudomonas diminuta*
4. *Stenotrophomonas maltophilia*
5. *Pseudomonas pseudoalcaligenes*
6. *Burkholderia cepacia*
7. *Pseudomonas putida*
8. *Pseudomonas syringae*
9. *Providencia stuartii*
10. *Proteus mirabilis*
11. *Proteus vulgaris*
12. *Citrobacter freundii*
13. *Enterobacter aerogenes*
14. *Klebsiella oxytoca*
15. *Klebsiella pneumoniae*
16. *Haemophilus influenzae*
17. *Legionella pneumophila*
18. *Serratia liquefaciens*
19. *Serratia marcescens*
20. Negative control

**Figure 11. Molecular marker VI (pgi) sequences amplified from different Gram negative bacteria (SEQ ID NOs 256-277).**

**256. *Providencia stuartii* (SEQ ID NO. 256) *PSTU***  
TATGGTNNGCGATTGGCCTATCCATTATCTTGTACCGTGGGTATGACAATTTTGTTTCAGCTCCTCGAAGGGGCT  
CATGCAATGGATAAGCACTTTACCCAAACGGCTTTTGAAAAGAATATTCCTGTTCTCCTTGGCTTAATTGGCATT  
TGGTATAACAACCTTTTTTGAGTCGGAACTGAAGCGATTCTGCCATATGATCAATATATGCACCGTTTTGCGGCT  
TATTTCCAACAAGGAAATATGGAGTCAAATGGTAAGTATATTGACCGTAATGGCAACAAAGTTTCTTATCAAACG  
GGGCAATTATTTGGGGTGAACCGGGCACGAACGGCCAACATGCCTTTTATCAATTGATCCATCAAGGAATAAA  
ATGATCCCTTGTGATTTTATTGCGCCAGCAGTAACGCATAATCCACTCGGTGATCATCACGATAAATTACTGTCTG  
AACTTCTTCGCC

**257. *Enterobacter cloacae* (SEQ ID NO. 257) *ECLC***  
CTTTGTGGTNCTGCGATCGGCCTGTCTATCATTCTCTCCGTGGGCTTCGACAACCTTTGTTGAGCTGCTCTCCGGC  
GCGCACGCGATGGACAAACACTTCTCCACCACCGCACCTGAGAAAAACCTGCCGGTGCTGCTGGCGCTGATCGGT  
ATCTGGTACAACAACCTTCTCGGCGCAGAGACCGAAGCGATCCTGCCGTACGACCAGTACATGCACCGCTTCGCG  
GCTTACTTCCAGCAGGGCAATATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCGGTGGATTACCAG  
ACTGGCCCAATCATCTGGGGTGAGCCAGGCACCAACGGTCAGCACGCGTTCTACCAGCTGATTACCAGGGGACC  
AAAATGGTACCGTGCGATTTTCATCGCCCCGGCTATACCCACAATCCACTGTCTGATCACCATCCTAAACTGCTG  
TCTAACTTCTTCGCC

**258. *Proteus mirabilis* (SEQ ID NO. 258) *PMIR***  
CTTATGGTNNGCAATTGGTTTATCCATTGTATTATCTATTGGTTATGACAACCTTTGAGCAGTTACTGTCCGGTGC  
TCATGCTATGGATAATCACTTTAGAACCCTGAAGCTGAAAATAATATTCGATGATATTGGCGCTTATTGGCAT  
TTGGTATAACAATTTTTTTGGTACCGAACTGAAGCGATTCTGCCATACGATCAATATATGCACCGTTTTGCTGC  
TTACTTCCAACAAGGTAATATGGAATCCAATGGTAAATATATCGACCGTGATGGAAACAAAGTCAGTTACCAAAC  
CGGACCTATTATTTGGGGAGAGCCGGGACTAATGGTCAGCATGCGTTTTATCAATTAATTCATCAAGGAACCAA  
ACTGATCCCTTGTGATTTTATTGCACCAGCGATCAGCCATAATCCATTATCTGATCATCATGCAAACTAATGTC  
GAACTTCTTCGCAA

**259. *Proteus vulgaris* (SEQ ID NO. 259) *PVUL***  
TTATGGTNNGCTATTGGTTTGTCTATCGCTCTTTCCGTTGGTTATGATAATTTGAGCAATTATTGGAAGGTGCCC  
ATGCAATGGATAACCATTTCCAAACGACAGCTGCTGAAAATAACCTACCAATGATCCTCGCGCTGATTGGCATTT  
GGTATAACAATTTTTTTGGTACAGAACTGAAGCGATTCTGCCCTATGATCAATACATGCATCGTTTTGCAGCCT  
ATTTCCAACAAGGCAATATGGAGTCAAATGGTAAGTATATTGATCGCGATGGTAACGCAGTTAACTATCAAACG  
GACCTATTATTTGGGGTGAACAGGAATAATGGTCAGCATGCGTTTTACCAATTAATTCATCAGGGTACAAAAA  
TGATCCCTTGTGATTTTATTGCGCCTGCAATTAGTCATAATCCATTAAGTGATCACCATGCTAAGTTGATGTCTA  
ACTTCTTCGCNA

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**260. *Enterobacter aerogenes* (SEQ ID NO. 260)****EAER**

CTGTGGTCCGCCTCGGTCTGTCTATCATTCTGTCCGTCGGCTTCGACAACTTCGTTTCAGCTGCTGTCCGGCGCCC  
ACGCCATGGACAAACACTTCTCTACCACGCCGGCTGAGAAAAACCTGCCGGTACTGCTGGCGCTGATTGGTATCT  
GGTACAACAATTTCTTCGGCGCCGAAACCGAAGCAATTCTGCCGTACGATCAGTACATGCATCGCTTTGCCGCTT  
ACTTCCAGCAGGGCAACATGGAATCCAACGGTAAGTACGTTGACCGTAACGGCAACGTCGTGGATTACCAGACTG  
GCCCTATCATCTGGGGCGAGCCGGGGACTAACGGTCAGCACGCGTTCTATCAGCTGATCCACCAGGGCACCACAAA  
TGGTACCGTGCGATTTTCATCGCCCCGGCTATCACCCATAACCCGCTGTCTGACCACCATCAGAACTGCTGTCTA  
ACTTCTTCGCAA

**261. *Klebsiella pneumoniae* (SEQ ID NO. 261)****KPNE**

CTGTGGTCCGGCGATTGGTCTGTCCATCATTCTCTCCGTGGGCTTCGACAACTTCGTTGAGCTGCTGTCCGGCGCG  
CATGCGATGGATAAGCACTTCTCCACCACTCCGGCGGAGAAAAACCTGCCGGTGTCTGCTGGCGCTGATCGGCATC  
TGGTACAACAACCTTCTTCGGTGCGGAAACCGAAGCGATTCTGCCGTACGACCAGTACATGCACCGCTTTGCCGCT  
TACTTCCAGCAGGGCAACATGGAGTCCAACGGTAAGTATGTTGACCGTAACGGCCACGCGGTAGACTACCAGACT  
GGCCCAATCATCTGGGGTGAGCCGGGCACCAACGGTCAGCACGCGTTCTACCAGCTGATCCACCAGGGCACCACAAA  
ATGGTACCGTGCGATTTTCATCGCTCCGGCTATCACCCACAACCCGCTGTCTGACCACCATCAGAACTGCTGTCT  
AACTTCTTCGCNAA

**262. *Escherichia coli* 0157 :H7 (SEQ ID NO. 262)****ECO157**

TTTGTGGTNGCGATTGGCCTGTCGATTGTTCTCTCCATCGGCTTTGATAACTTCGTTGAACTGCTTTCTGGCGCA  
CACGCGATGGACAAGCATTTCTCCACCACGCCTGCCGAGAAAAACCTGCCTGTACTGTTGGCGCTGATTGGCATC  
TGGTACAACAATTTCTTTGGTGCGGAACTGAAGCGATTCTGCCGTATGACCAGTATATGCACCGTTTCGCGGCG  
TACTTCCAGCAGGGCAATATGGAGTCCAACGGTAAGTATGTTGACCGTAACGGTAACGTTGTGGATTACCAGACT  
GGCCCGATTATCTGGGGTGAACCAGGCACTAACGGTCAGCACGCGTTCTACCAGCTGATCCACCAGGGAACCAAAA  
ATGGTACCGTGCGATTTTCATCGCTCCGGCTATCACCCATAACCCGCTCTCTGATCACCACCAGAACTGCTGTCT  
AACTTCTTCGCNAA

**263. *Escherichia coli* K12 (SEQ ID NO. 263)****ECOK12**

CTTTGTGGTNGCGATTGGCCTGTCGATTGTTCTCTCCATCGGCTTTGATAACTTCGTTGAACTGCTTTCCGGCGC  
ACACGCGATGGACAAGCATTTCTCCACCACGCCTGCCGAGAAAAACCTGCCTGTACTGCTGGCGCTGATTGGCAT  
CTGGTACAACAATTTCTTTGGTGCGGAACTGAAGCGATTCTGCCGTATGACCAGTATATGCACCGTTTCGCGGCG  
GTACTTCCAGCAGGGCAATATGGAGTCCAACGGTAAGTATGTTGACCGTAACGGTAACGTTGTGGATTACCAGAC  
TGGCCCCGATTATCTGGGGTGAACCAGGCACCTAACGGTCAGCACGCGTTCTACCAGCTGATCCACCAGGGAACCAA  
AATGGTACCGTGCGATTTTCATCGCTCCGGCTATCACCCATAACCCGCTCTCTGATCATCACCAGAACTGCTGTC  
TAACTTCTTCGCNAA

**264. *Citrobacter freundii* (SEQ ID NO. 264)****CFRE**

NTGTGGTCTGCAATCGGCCTGTCCATCATCCTGTCCGTAGGCTTCGACAATTTTGTTGAGCTGCTCTCCGGCGCG  
CATGCGATGGACAAACACTTCTCCACCACCCCGCTGAGAAAAACCTGCCGGTGTCTGCTGGCGCTGATCGGTATC

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TGGTACAACAACCTTCTTCGGTGCCGAAACCGAAGCGATTCTGCCGTATGACCAGTATATGCACCGTTTCGCGGCC  
TACTTCCAGCAGGGCAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAATGCGGTGGATTACCAGACT  
GGCCCAATCATCTGGGGTGAGCCGGGTACTAACGGCCAGCATGCGTTCTACCAGCTGATCCACCAGGGCACCAAA  
ATGGTGCCGTGCGATTTTCATCGCGCCGGCAATCACCACAACCCGCTGTGCGATCACCATCCGAAACTGCTGTCT  
AACTTCTTCGCAA

**265.      *Haemophilus influenzae* (SEQ ID NO. 265)      HINF**

CTTNGGTNGCCTTGGTCTTTCAATTGCGCTATCAATTGGCTTTGAAAACCTTTGAAGCGTTATTAAATGGCGCGCA  
TGAAATGGATGAACATTTCCGCTCTACTCCAATCGAACAAAATATCCCAACCACTTTAGCATTAGTTGGTTTATG  
GAATACCAATTTTCTTGGTGCGCAAACAGAAGCGATCTTACCTTATGATCAATATTTACATCGCTTCGCAGCTTA  
TTTTCAACAAGGTAATATGGAATCAAATGGTAAATATGTGGATCGTGATGGCAATGTCATTAACAATTATCAAAC  
TGGCCCTATCATTTGGGGAGAACCTGGTACAAACGGACAACACGCGTTCTATCAATTAATTCATCAAGGCACTAC  
TTTAATTCCTTGTGATTTTATCGCACCCGCTCAAAGCCATAACCCATTGGCAGATCATCACAATAAATTGCTTTC  
AAACTTCTTCGCAA

**266.      *Serratia marcescens* (SEQ ID NO. 266)      SMAR**

TGTGGTTCGGCGATCGGTTTGTGCGATTGCGCTGTCCATCGGTTATGACAACTTCGAGCAGCTGCTGAGCGGCGCGC  
ACGCCATGGACAAGCACTTCGCCGAAACGCCGGCGGAGAAAAACCTGCCGGTGTTGCTGGCGCTGATCGGTATTT  
GGTACAACAACCTTCTTTGGCGCCGAAACCGAAGCCATTCTGCCGTACGATCAGTACATGCACCGTTTTGCCGCTT  
ACTTCCAGCAGGGCAACATGGAATCCAACGGCAAGTACGTGATCGCAACGGCAACCCGGTGGATTACCAGACCG  
GTCCCATCATTTGGGGCGAGCCGGGCACCAACGGCCAGCATGCGTTCTATCAGTTGATCCACCAGGGCACCAAGC  
TGGTGCCGTGCGATTTTCATCGCGCCGGCCATCAGCCATAACCNCTGGGCGATCATCACGCCAAACTGCTGTCCA  
ACTTCTTGCCAA

**267.      *Morganella morganii* (SEQ ID NO. 267)      MMOR**

GTGGTTCGGCGATTGGTCTGTCTATCGTGCTCTCTGTGCGTTATGACAACTTCACGCAGTTGCTCGATGGTGCGTA  
TGCCATGGACAAGCACTTCACCGAAACTGAATTCTCACAGAATATTCGGTGCTGCTGGCGCTGATTGGTCTGTG  
GTACAACAATTTCTTCGGTGCGGAAACAGAAGCAATTCTGCCTTATGATCAGTACATGCACCGCTTTGCGGCCCTA  
TTTCCAGCAGGGCAATATGGAGTCCAACGGGAAATATGTGGATCGTAACGGTAAGGTGGTTTCTCATCAGACCGG  
TCCGTTATCTGGGGTGAGCCCGGCACCAACGGGCAGCATGCGTTTTATCAGCTGATCCATCAGGGTACCAAACCT  
GATCCCGTGTGATTTTATCGCACCCGGCTCAGAGCCATAATCCGCTGGGGGATCATCACAGTAAACTGCTGTGCGAA  
CTTCTTCGCAA

**268.      *Klebsiella oxytoca* (SEQ ID NO. 268)      KOXY**

GTGGTAGCCTCGGCCTGTCCATCATCCTGTCCGTGGGCTTCGACAACTTTGTTGAGCTGCTCTCCGGCGCGCACG  
CGATGGATAAACACTTCTCCACCACCCCGGCTGAGAAAAACCTGCCGGTGCTGCTGGCGCTGATCGGTATCTGGT  
ACAACAACCTTCTTCGGCGCTGAAACCGAAGCGATTCTGCCGTACGACCAGTATATGCACCGTTTTGCCGCTTACT  
TCCAGCAGGGCAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGACGGGCC  
CAATCATCTGGGGCGAGCCGGGGACCAACGGTCAGCACGCGTTCTACCAGCTGATTACACAGGGGACCAAAATGG



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TGCCTTGC GACTTTATCGCGCCGGCGATTACGCATAACCCGCTGTCCGATCACCATCCGAAGCTGCTGTCTAACT  
TCTTCGCCCAA

**269. *Shigella sonnei* (SEQ ID NO. 269)****SSON**

TTTGTGGTNGCGATTGGCCTGTCGATTGTTCTCTCCATCGGCTTTGATAACTTCGTTGAACTGCTTTCTGGCGCA  
CACGCGATGGACAAGCATTTCTCCACCACGCCTGCCGAGAAAAACCTGCCTGTCTGCTGGCGCTGATTGGCATC  
TGGTACAATAATTTCTTTGGTGCGGAACTGAAGCGATTCTGCCGTATGACCAGTATATGCACCGTTTCGCGGCG  
TACTTCCAGCAGGGCAATATGGAGTCCAACGGTAAGTATGTTGACCGTAACGGTAACGTTGTGGATTACCAGACT  
GGCCCGATTATCTGGGGTGAACCAGGCACTAACGGTCAGCACGCGTTCTACCAGCTGATCCACCAGGGAACCAAA  
ATGGTACCGTGCGATTTCATCGCCCCGGCTATCACCATAACCCGCTCTCTGATCACCACCAGAAACTGCTGTCT  
AACTTCTTCGCAA

**270. *Salmonella enteritidis* (SEQ ID NO. 270)****SENT**

GCTGTGGTCTGCNTCGGGCTGTCCATTATTCTGTCCGTCGGTTTCGACAACTTTGTGCGAGCTGCTTTCCGGCGCG  
CACGCGATGGACAAGCATTTCTCCACCCTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCATC  
TGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTACGACCAGTATATGCACCGTTTCGCCGCC  
TACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAGCGGCAACGCCGTGGATTACCAGACA  
GGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAAA  
ATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTCT  
AACTTCTTCGCAA

**271. *Salmonella enterica hadar* (SEQ ID NO. 271)****SHAD**

CGCTGTGGTCTGCNTCGGGCTGTCCATTATTCTGTCCGTCGGTTTCGACAACTTTGTGCGAGCTGCTTTCCGGCGC  
GCACGCGATGGACAAGCATTTCTCCACCCTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCAT  
CTGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTACGACCAGTATATGCACCGTTTCGCCGC  
CTACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAGCGGCAACGCCGTGGATTACCAGAC  
AGGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAA  
AATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTC  
TAACTTCTTCGCAA

**272. *Salmonella enterica brandenburg* (SEQ ID NO. 272) SBRA**

NCGCTGTGGTCTGCCTCGGGCTATCCATTATTCTGTCCGTCGGTTTCGACAACTTTGTGCGAGCTGCTTTCCGGCG  
CACACGCGATGGACAAGCATTTCTCCACCCTCCGGCGGAGAAAAACCTACCCGTTCTGCTGGCGTTGATTGGCA  
TCTGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTACGACCAGTATATGCACCGTTTCGCCG  
CCTACTTCCAGCAGGGCAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGA  
CAGGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTA  
AAATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGT  
CTAACTTCTTCGNAA

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**273. *Salmonella enterica* derby (SEQ ID NO. 273) SDER**

GCTGTGGTCTGCNTCGGGCTGTCCATTATTCTGTCCGTCCGTTTCGACAACTTTGTGAGCTGCTTTCCGGCGCG  
CACGCGATGGACAAGCATTCTCCACCACTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCATC  
TGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTACGACCAGTATATGCACCGTTTCGCCGCC  
TACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGACA  
GGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAAA  
ATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTCT  
AACTTCTTCGCNAA

**274. *Salmonella enterica* virschow (SEQ ID NO. 274) SVIR**

CGCTGTGGTCTGCCTCGGGCTGTCCATTATTCTGTCCGTCCGTTTCGACAACTTTGTGAGCTGCTTTCCGGCGCG  
GCACGCGATGGACAAGCATTCTCCACCACTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCAT  
CTGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTACGACCAGTATATGCACCGTTTCGCCGCC  
CTACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGAC  
AGGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAA  
AATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTC  
TAACTTCTTCCAA

**275. *Salmonella enterica* typhimurium (SEQ ID NO. 275) STPM**

GCTGTGGTCTGCNTCGGGCTGTCCATTATTCTGTCCGTCCGTTTCGACAACTTTGTGAGCTGCTTTCCGGCGCG  
CACGCGATGGACAAGCATTCTCCACCACTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCATC  
TGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTATGACCAGTATATGCACCGTTTCGCCGCC  
TACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGACA  
GGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAAA  
ATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTCT  
AACTTCTTCGCNAA

**276. *Salmonella enterica* paratyphi B (SEQ ID NO. 276) SPTB**

CGCTGTGGTCTGCNTCGGGCTGTCCATTATTCTGTCCGTCCGTTTCGACAACTTTGTGAGCTGCTTTCCGGCGCG  
GCACGCGATGGACAAGCATTCTCCACCACTCCGGCGGAGAAAAACCTACCCATTCTGCTGGCGTTGATTGGCAT  
CTGGTACAACAATTTCTTCGGCGCGGAAACCGAAGCCATTCTGCCGTATGACCAGTATATGCACCGTTTCGCCGCC  
CTACTTCCAGCAGGGTAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAGAC  
AGGCCCAATTATCTGGGGCGAACCAGGCACCAACGGTCAGCACGCGTTTTATCAATTGATTCACCAGGGTACTAA  
AATGGTGCCGTGTGATTTTATCGCCCCGGCTATCACCCATAACCCGCTATCCGATCATCATCAGAAGCTGCTGTC  
TAACTTCTTCCAA

**277. *Serratia liquefaciens* (SEQ ID NO. 277) SLIQ**

NTGTGGTCGGCGATTGGCCTGTCTATCGCCCTGTCAGTGGGTTACGAGAATTTGAACAGTTGCTGAGCGGCGCG  
CACGCGATGGACAAACACTTCGCGCAAACGCCGGCAGAGCAAAACCTGCCGGTGCTGCTGGCGTTGATCGGTATC  
TGGTACAACAATTTCTTCGGTGCGAAACCGAAGCTATCCTGCCGTACGACCAGTACATGCACCGTTTTCGCCGT

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TACTTCCAGCAGGGCAACATGGAATCCAACGGTAAATATGTCGATCGCAACGGCAATCCGGTGGACTACCAGACC  
GGCCAATCATCTGGGGCGAGCCGGGCACCAACGGGCAGCACGCGTTTTACCAACTGATCCACCAGGGGACCAAA  
CTGGTGCCTTGTGACTTTATCGCGCCGGCCATCAGCCATAATCCGCTGAGCGACCACCATGCAAAACTGCTGTCG  
AACTTCTTCGCCAA

**Figure 12. Molecular marker VII (EG10839 & EG11396 or *sfrB* & *yigC*) in Gram-negative bacteria (SEQ ID NOs 278-303).**

**278. *Neisseria meningitidis* serogroup A strain Z2491  
(SEQ ID NO. 278)**

ACAGAAAATCCTCGAAGACACCCCTGCTGGAACAATGGCAGTGGCTCAAACCTAAAGAACCGTAAACATCCTGCGT  
ACACAAATGCCGTCTGAAACGCCCCACGCTTCAGACGGCAGACCGTAAACCTACAACCCCAATTCCTCCCAAA  
TCTCATCAATCTTAGCCGTAACCGCAGGGTCTTTTTTAATCACCCGTCCCCATTCGCGGTGCGTTTCGCCCCGGCC  
ACTTGTGTGGTCGCATCCAAACCCATTTTGCCGCCAAGTCCGCTGACGGGGCTGGCGAAGTCGAGGTAGTCGATGG  
GCGTGTTCATCAAAACGGTATCGCGCACGGGGTCCATGCGCGTGGTTACCGCCCAGATGACTTCTTTCCAGT  
CGCGCACATCCACATCGTCATCCACCACAATGATGAATTTGGTGTACATAAACTGGCGCAGGAACGACCAGCAGC  
CCATCATCACGCGCTTGGCGTGTCCGGCGTACTGTTTTTCATGCTCACCACCGCCATGCGGTAGGAGCAGCCTT  
CGGGCGGCAGGTAAAAATCGGTGATTTGCGGGAACTGCTTTTGCAAAGCGGTACGAACACTTCGTTCAACGCCA  
CGCCAAAACGGCGGGTTCATCGGGCGGTTTGCTGTGTAGGTAGAGTGGTAAATCGGGTTTTCGCGCATGGTGA  
TGCGTTCGACCGTAAACACGGGGAAATGGTCTCTGCTGTTGTAATAGCCCGTGTGGTCGCCGTATGGACCTTCCA  
ACGCGGTTTTGTTTTGGATGGATGACGCTTCCAACACGATTTCTGCGCGGGCAGGCACCTGCAAATCGTTGCCGA  
TACATTTACCAAGTTCCGTCCGCGAACCGCGCAGCAGTCCGGCAAACCTGGTATTCGCTCAAGGTATCGGGAACGG  
GCGTTACCGCGCCCAAAATGGTGGCAGGGTTCGACGCCGAGCACGACGGCGACGGGATACGGCGTATCGGGATTGA  
GTTTGCGGAATTCCTGATAATCCAGCGCGCCGCCGCGATGCGACAGCCAGCGCATAATCAGCTTGTTTATGCCGA  
TTAATTGTTGGCGGTAAATGCCGAGATTTTGCGGTTTTTGTGCGGCCCCGCGGTGACGGTCAAGCCCCACGTTA  
CCAGCGGGCGCAACGTCTTCGGGCCAGCAATGCTGAATCGGAAGTTGATACAAATCAACGTCTTCGCTTCCATA  
CGATTTCTTGACACGGCGCATTTTTACACAGTTTCGGCGCCATGCTCCAAATGTCTTTCAAGAGCGGCAGTTTGG  
AAAACGCGTCTTTAATGCCTTTGGGCGGTTTCGGGTTCTTTCAAATACGCCAGCGTCTGCCCCGATTTTCGCGCAGCT  
TGGACACGCTGTCCGCGCCCATGCCATCGCCACACGTTTCGGGCGTGCCGAACAGGTTTGCCAACACGGGATAAT  
CATAGCGGTACCGTCGGGCTTAACCTGGGTGTTCAAACAACAACGCCGGCCCTTCGGCGCGCAGCACGCGGTGCG  
CGATTTTCGGTCATTTCCAAATGCGGGGAAACGGGGTGCGCGATGCGTTTGAGTTTGCCCTGCTGCTCGAGCATGG  
CGATGAAGTCGCGCAGGTCTTTGTATTTTCATATTCATCCTTTTTGTCTTTTATCCTGAGCAATCCGATTTCGGAT  
ACCGCCCCATCCTTGCTGCGCTTCGGCATATTCTATGCCGTGATAAAAGTCGCGTACCAGCGGATGTTTCGCTG  
CCTTGATGGAGTTGCAACAAAGGACGTTGACCATCGGGTTGGGTAACGACATTGCAATGCAAACCGAAGGTGTGCG  
GATTTCGTAAGGGGGCAGCCGTTGCAGATCATGCCGAAATAAACGGCGTTTTTCAGGGTTG

**279. *Klebsiella oxytoca* (SEQ ID NO. 279)**

ACGACCAGACGCCCCATCATGACGCGTTTTGCGGTGACCGGCGTACTGCTTCTTCATCGTGACGACCGCCAGGCGAT  
AGGAACAGCCTTCAGGCGGCAAATAGAAATCCACGATTTTCAGGAACTGCTTTTGAGAATGGGGACGAACACTT  
CGTTCAGCGCAACGCCCAGTACCGCCGGCTCATCCGGCGGGCGCCCCGGTATAGGTCGAGTGATAGATGGCATCTT  
CACGCTGAGTAATGTGGGTAACGGTAAAGACCGGGAAGTTATCCACTTCATTGTAGTAGCCAGTATGGTCGCCAT  
AGGGGCCCTTCGGCGCCATTTCTCCGGCTTCAATATACCCTTCCAGCACGATCTCCGCGCTGGCGGGCACCTCAA  
GATCGTTAGAGATGCACTTCACGACTTCGGTTTTGGTGCCGCGCAGTAGCCCGGCAAAAGCGTATTCGGAAAGAG  
TATCCGGAACCGGAGTCACCGCCCCGAGAATGGTTGCCGGATCGGCGCCCAGCGCGACGGAGACGGGAAACGCT  
CGCCAGGACGCGCCGCGCACCACTCCTGGAAGTCCAGCGCGCCGCCGCGATGCGATAGCCAAC

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**280. *Salmonella enterica* subsp. *enterica* serovar*****Paratyphi* A (SEQ ID NO. 280)**

ATGGACGCCATGAAATATCACGATTTACGCGACTTCCTGACGCTACTTGAGCAACAGGGGGAACATAAAACGCATC  
ACGCTACCTGTGGATCCTCATCTGGAAATTACGGAAATCGCTGACCGCACGCTGCGTGCCGGTGGACCGGCGTTG  
CTGTTTGAAAAGTCTTAAAGGTTACGCCATGCCGGTGCTGTGCAACCTTTTTGGCACGCCAAAACGCGTGGCGATG  
GGCATGGGGCAGGATGATGTTTCCGCCTTACGGGAAGTGGGTAAATTATTAGCGTTTCTGAAAGAACCTGAGCCG  
CCGAAAGGCTTTCGCGATCTGTTTGACAAGCTGCCGCAGTTTAAGCAAGTGCTGAATATGCCGACGAAACGGTTA  
CGCGGCGCGCCTTGCCAGCAGAAAATCGCGTCTGGCGATGATGTGATTTAACGCGTCTTCCTGTCTATGACCTGT  
TGGCCGGACGACGCCGCGCCGCTGATTACCTGGGGACTGACGGTAACGCGTGGCCCGCACAAAGAACGGCAAAAC  
CTGGGCATTTATCGTCAGCAGTTGATAGGTAAAAATAAGCTGATTATGCGCTGGCTGTCTCACCGCGGCGGCGCG  
TTGGATTTTCAGGAGTGGTTAGCCGCGCGTCCGGGTGAACGTTTCCCGGTCTCCGTGCGATTGGGCGCCGATCCG  
GCGACGATACTTGGCGCCGTGACTCCTGTTCCCGATACTCTGTGCGAGTATGCCTTTGCGGGCCTGCTGCGCGGC  
ACGAAAACCTGAAGTGGTTAAATGCCTTTCTAACGATCTGGAAGTGCCTGCCAGCGCCGAGATTATCCTTGAAGGT  
TACATTGAGCCGGGAGAGATGGCGCCGGAAGGACCGTATGGCGATCATACGGGCTATTATAATGAAGTGGATAAC  
TTTCCGGTCTTTACCGTCACGCATATTACGCAGCGTGAGGATGCCATCTATCACTCCACCTATACCGGGCGTCCG  
CCCGATGAGCCTGCGGTATTAGGGGTGGCGCTCAATGAAGTCTTCGTGCCTATTCTGCAAAAACAGTTTCCGGAA  
ATCGTCGACTTTTATCTGCCGCCGGAAGGGTGTCTTACCGCCTGGCGGTAGTGACGATGAAAAGCAGTACGCT  
GGTCATGCGAAACGCGTCATGATGGGCGTCTGGTCTGTTTTGCGCCAGTTTATGTATACGAAATTTGTTATCGTT  
TGCGATGATGACGTTAACGCACGCGACTGGAATGATGTGATCTGGGCGATTACCACCCGTATGGACCCTGCGCGG  
GATACGGTGCTGGTTGAAAATACGCCGATTGATTACCTGGATTTTGCTCGCCGGTCTCCGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACAAACAAATGGCCGGGCGAAACCCAACGCGAGTGGGGTCTGCTCTATTGTTAAAGATCCT  
GAAGTTACCGCACGTATTGATGCGATTTGGGATGAGCTGGCTATCTTTAAATAA

**281. *Salmonella typhimurium* LT2 (SEQ ID NO. 281)**

GAGGCTACAATGGACGCCATGAAATATCACGATTTACGCGACTTCCTGACGCTACTTGAGCAGCAGGGGGGAACATA  
AAACGCATCACGCTACCTGTGGATCCTCATCTGGAAATCACGGAAATCGCTGACCGCACGCTGCGTGCCGGTGGAA  
CCGGCGTGTCTGTTTGAAAATCCTAAAGGTTACGCCATGCCGGTGCTGTGCAACCTTTTTGGCACGCCAAAACGC  
GTGGCGATGGGCATGGGGCAGGATGATGTTTCCGCCTTACGGGAAGTGGGTAAATTATTAGCGTTTCTTAAAGAA  
CCTGAGCCGCCGAAAGGCTTTCGCGATCTGTTTGACAAGCTGCCGCAGTTTAAGCAAGTGCTGAATATGCCGACG  
AAACGGTTACGCGGCGCGCCTTGCCAGCAGAAAATCGCGTCTGGCGATGATGTGATTTAACGCGTCTTCCTGTC  
ATGACCTGTTGGCCGGACGACGCCGCGCCGCTGATTACCTGGGGACTGACGGTAACGCGTGGTCCGCACAAAGAG  
CGGCAAAACCTGGGCATTTATCGTCAGCAGTTGATAGGTAAAAATAAGCTGATTATGCGCTGGCTGTCTCACCGC  
GGCGGCGCGCTGGATTTTCAGGAGTGGTTAGCCGCGCGTCCGGGTGAACGTTTCCCGGTCTCCGTGCGATTGGGC  
GCCGATCCGGCGACGATACTTGGCGCCGTGACTCCTGTTCCCGATACTCTGTGCGAGTATGCCTTTGCGGGCCTG  
CTGCGCGGCACGAAAACCTGAAGTGGTTAAATGCCTTTCTAACGATCTGGAAGTGCCTGCCAGCGCCGAGATTATC  
CTTGAAGGTTACATTGAGCCGGGAGAGATGGCGCCGGAAGGACCGTATGGCGATCATACGGGCTATTATAATGAA  
GTGGATAGCTTTCCGGTCTTTACCGTCACGCATATTACACAGCGTGAGGATGCCATCTATCACTCCACCTATACC  
GGGCGTCCGCCCAGTATGAGCCTGCGGTATTAGGGGTGGCGCTCAATGAAGTCTTCGTGCCTATTCTGCAAAAACAG  
TTTCCGGAAATCGTCGACTTTTATCTGCCGCCGGAAGGGTGTCTTACCGCCTGGCGGTAGTGACGATGAAAAG

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CAGTACGCTGGTCATGCGAAACGCGTCATGATGGGCGTCTGGTCGTTTTTGCGCCAGTTTATGTATACGAAATTT  
GTTATCGTTTTGCGATGATGACGTTAACGCACGCGACTGGAATGATGTGATCTGGGCGATTACCACCCGTATGGAC  
CCTGCACGGGATACGGTGCTGGTTGAAAATACGCCGATTGATTACCTGGATTTTGCCTCGCCGGTCTCCGGGCTG  
GGTTCAAAAATGGGGCTGGATGCCACAAACAAATGGCCGGGCGAAACCAACGCGAGTGGGGTCGTCTATTGTT  
AAAGATCCTGAAGTTACCGCGCGTATTGATGCGATTTGGGATGAGCTGGCTATCTTTAAATAA

**282. *Escherichia coli* CFT073 (SEQ ID NO. 282)**

ATGGACGCCATGAAATATAACGATTTACGCGACTTCTTGACGCTGCTTGAACAGCAGGGTGAGCTAAAACGTATC  
ACGCTCCCGGTGGATCCGCACCTGGAAATCACTGAAATTGCTGACCGCACTTTGCGTGCCGGTGGGCCTGCGCTG  
TTGTTGAAAACCTAAAGGCTACTCAATGCCGGTGCTGTGCAACCTGTTCCGGTACGCCAAAGCGCGTGCGCATG  
GGCATGGGGCAGGAAGATGTTTCGGCGCTGCGTGAAGTTGGTAAATTATTGGCGTTTCTGAAAGAGCCGGAGCCG  
CCAAAAGGTTTCCGCGACCTGTTTGATAAACTGCCGCAGTTTAAGCAAGTATTGAACATGCCGACAAAGCGACTG  
CGTGGTGCACCCTGCCAACAAAAATCGTCTCTGGCGATGACGTCGATCTCAATCGCATTCCCATTATGACCTGC  
TGGCCGGAAGATGCCGCGCCGCTGATTACCTGGGGGCTCACCGTAACGCGCGGCCCGCATAAAGAGCGGCAGAAT  
CTGGGCATTTATCGCCAGCAGCTAATTGGTAAAAACAACTGATTATGCGCTGGCTGTGCGATCGCGGCGGCGCG  
TTGGATTATCAGGAGTGGTGTGCGGCGCATCCGGGCGAACGTTTCCCGGTTTCTGTGGCGCTGGGTGCCGATCCT  
GCCACGATTCTCGGTGCAGTCACCCCGTTCCGGATACGCTTTCAGAGTATGCGTTTGCCGGATTGCTGCGCGGT  
ACCAAGACCGAAGTGGTGAAGTGTATCTCCAATGACCTTGAAGTGCCCGCCAGTGCGGAGATTGTGCTGGAAGGG  
TATATCGAACAAGGCGAACTGCGCCGGAAGGGCCGTATGGCGACCACACCGGTTACTATAACGAAGTCGATAGT  
TTTCCGGTATTTACCGTGACGCATATTACCCAGCGTGAAGATGCGATTTATCATTCCACCTATACCGGGCGTCCG  
CCAGATGAACCTGCGGTACTGGGTGTAGCACTGAACGAAGTGTTCGTGCCGATTCTGCAAAAACAGTTCGCGGAA  
ATTGTCGATTTTTATCTGCCGCCGGAAGGCTGTTCTTATCGTCTGGCGGTAGTGACGATCAAAAAACAGTACGCC  
GGACACGCGAAGCGCGTCATGATGGGCGTCTGGTCGTTCTTACGCCAGTTTATGTACACTAAATTTGTGATCGTT  
TGCGATGATGACGTCAACGCCCGGACTGGAACGATGTGATTTGGGCGATTACCACCCGTATGGACCCGGCGCGG  
GATACTGTTCTGGTAGAAAATACGCCTATTGATTATCTGGATTTTGCCTCGCCTGTCTCCGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACGAATAAATGGCCGGGTGAAACCCAGCGTGAATGGGGACGTCCCATCAAAAAGATCCA  
GATGTTGTGCGCATATTGACGCCATTTGGGATGAACTGGCTATTTTAAACAACGGTAAAAGCGCCTGA

**283. *Escherichia coli* K12 (SEQ ID NO. 283)**

ATGGACGCCATGAAATATAACGATTTACGCGACTTCTTGACGCTGCTTGAACAGCAGGGTGAGCTAAAACGTATC  
ACGCTCCCGGTGGATCCGCATCTGGAAATCACTGAAATTGCTGACCGCACTTTGCGTGCCGGTGGGCCTGCGCTG  
TTGTTGAAAACCTAAAGGCTACTCAATGCCGGTGCTGTGCAACCTGTTCCGGTACGCCAAAGCGCGTGCGCATG  
GGCATGGGGCAGGAAGATGTTTCGGCGCTGCGTGAAGTTGGTAAATTATTGGCGTTTCTGAAAGAGCCGGAGCCG  
CCAAAAGGTTTCCGCGACCTGTTTGATAAACTGCCGCAGTTTAAGCAAGTATTGAACATGCCGACAAAGCGGCTG  
CGTGGTGCGCCCTGCCAACAAAAATCGTCTCTGGCGATGACGTCGATCTCAATCGCATTCCCATTATGACCTGC  
TGGCCGGAAGATGCCGCGCCGCTGATTACCTGGGGGCTGACAGTGACGCGCGGCCACATAAAGAGCGGCAGAAT  
CTGGGCATTTATCGCCAGCAGCTGATTGGTAAAAACAACTGATTATGCGCTGGCTGTGCGATCGCGGCGGCGCG  
CTGGATTATCAGGAGTGGTGTGCGGCGCATCCGGGCGAACGTTTCCCGGTTTCTGTGGCGCTGGGTGCCGATCCC  
GCCACGATTCTCGGTGCAGTCACTCCCGTTCCGGATACGCTTTCAGAGTATGCGTTTGCCGGATTGCTACGTGGC  
ACCAAGACCGAAGTGGTGAAGTGTATCTCCAATGATCTTGAAGTGCCCGCCAGTGCGGAGATTGTGCTGGAAGGG

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TATATCGAACAAGGCGAACTGCGCCGGAAGGGCCGTATGGCGACCACACCGGTACTATAATGAAGTCGATAGT  
TTCCCGGTATTTACCGTGACGCATATTACCCAGCGTGAAGATGCGATTTACCATTCCACCTATACCGGGCGTCCG  
CCAGATGAGCCCGCGGTGCTGGGTGTCGCACTGAACGAAGTGTGTTGTGCCGATTCTGCAAAAACAGTTCCCGGAA  
ATTGTCGATTTTTACCTGCCGCCGGAAGGCTGCTCTTATCGCCTGGCGGTAGTGACAATCAAAAACAGTACGCC  
GGACACGCGAAGCGCGTCATGATGGGCGTCTGGTCGTTCTTACGCCAGTTTATGTACACTAAATTTGTGATCGTT  
TGCGATGATGACGTTAACGCACGCGACTGGAACGATGTGATTTGGGCGATTACCACCCGTATGGACCCGGCGCGG  
GATACTGTTCTGGTAGAAAATACGCCTATTGATTATCTGGATTTTGCCTCGCCTGTCTCCGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACGAATAAATGGCCGGGGGAAACCCAGCGTGAATGGGGACGTCCCATCAAAAAAGATCCA  
GATGTTGTGCGCATATTGACGCCATCTGGGATGAACTGGCTATTTTTAACAACGGTAAAGCGCCTGA

**284. *Salmonella enterica subsp. enterica serovar Typhi***  
**(SEQ ID NO. 284)**

ATGGACGCCATGAAATATCACGATTTACGCGACTTCCTGACGCTACTTGAGCAGCAGGGGGAACATAAACGCATC  
ACGCTACCTGTGGATCCTCATCTGGAAATCACGGAAATCGCTGACCGCACGCTGCGTGCCGGTGGACCGGCGTTG  
CTGTTTGAAAATCCTAAAGGTTACGCCATGCCGGTGCTGTGCAACCTTTTTGGCACGCCAAAACGCGTGGCGATG  
GGCATGGGGCAGGATGATGTTTCCGCCTTACGGGAAGTGGGTAAATTATTAGCGTTTCTGAAAGAACCTGAGCCG  
CCGAAAGGCTTTCGCGATCTGTTTGACAAGCTGCCGCAGTTTAAGCAAGTGCTGAATATGCCGACGAAACGGTTA  
CGCGGCGCGCCTTGCCAGCAGAAAATCGCGTCTGGCGATGATGTGATTTAACGCGTCTTCTGTGATGACCTGT  
TGGCCGGACGACGCCGCGCCGCTGATTACCTGGGGACTGACGGTAACGCGTGGCCCGCACAAAGAACGGCAAAAC  
CTGGGCATTTATCGTCAGCAGTTGATAGGTAAAATAAGCTGATTATGCGCTGGCTGTCTCACCGCGGCGGCGCG  
TTGGATTTTCAGGAGTGGTTAGCCGCGCGTCCGGGTGAACGTTTCCCGGTCTCCGTCGCATTGGGCGCCGATCCG  
GCGACGATACTTGGCGCCGTGACTCCTGTTCCCGATACTCTGTGCGAGTATGCCTTTGCGGGCCTGCTGCGCGGC  
ACGAAAACCTGAAGTGGTTAAATGCCTTCTAACGATCTGGAAGTGCCTGCCAGCGCCGAGATTATCCTTGAAGGT  
TACATTGAGCCGGGAGAGATGGCGCCGGAAGGACCGTATGGCGATCATACGGGCTATTATAATGAAGTGGATAAC  
TTTCCGGTCTTTACCGTCACGCATATTACGCAGCGTGAGGATGCCATCTATCACTCCACCTATACCGGGCGTCCG  
CCCGATGAGCCTGCGGTATTAGGGGTGGCGCTCAATGAAGTCTTCGTGCCTATTCTGCAAAAACAGTTTCCGGAA  
ATCGTCGACTTTTATCTGCCGCCGGAAGGGTGTCTTACC GCCTGGCGGTAGTGACGATGAAAAGCAGTACGCT  
GGTCATGCGAAACGCGTCATGATGGGTGTCTGGTCGTTTTTGCGCCAGTTTATGTATACGAAATTTGTTATCGTT  
TGCGATGATGACGTTAACGCACGCGACTGGAATGATGTGATCTGGGCGATTACCACCCGTATGGACCTGCGCGG  
GATACGGTGCTGGTTGAAAATACGCCGATTGACTACCTGGATTTTGCCTCGCCGGTCTCCGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACAAACAAATGGCCGGGGGAAACCCAACGCGAGTGGGGTCGTCCTATTGTTAAAGATCCT  
GAAGTTACCGCGCGTATTGATGCGATTTGGGATGAGCTGGCTATCTTTAAATAA

**285. *Escherichia coli* O157:H7 EDL933 (SEQ ID NO. 285)**

ATGGACGCCATGAAATATAACGATTTACGCGACTTCTTGACGTTGCTTGAACAGCAGGGTGAGCTAAAACGTATC  
ACGCTCCCGGTGGACCCGCATCTGGAAATCACTGAAATTGCTGACCGCACGCTGCGTGCTGGTGGGCCTGCGCTG  
TTGTTTGAAAACCTTAAAGGGTACTCAATGCCGGTGCTGTGCAACTTGTTCCGTACGCCAAAGCGCGTAGCGATG  
GGTATGGGCCAGGAAGATGTTTCAGCACTGCGTGAAGTCGGTAAATTATTAGCATTTCTGAAAGAACCAGAGCCG  
CCAAAAGGTTTTTCGCGATCTGTTTGATAAGCTGCCGCAGTTTAAGCAGGTGTTAAACATGCCGACAAAGCGACTG  
CGCGGTGCACCCTGCCAACAAAAATCGTCTCTGGCGATGACGTCGATCTCAACCGTATTCCCATTATGACCTGT

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TGGCCGGAAGATGCCGCGCCGCTGATTACATGGGGGCTAACCGTTACACGTGGCCCTCATAAAGAGCGACAGAAT  
CTGGGCATTTATCGCCAGCAACTGATTGGTAAAAACAAGCTGATTATGCGTTGGCTGTGCGATCGCGGCGGCGCG  
CTGGATTATCAGGAGTGGTGTGCGGCGCATCCAGGTGAACGTTTCCCGATCTCTGTGGCGTTGGGCGCTGATCCG  
GCAACCATTCTCGGTGCAGTCACACCAGTACCAGATACTTTGTGCGGAATACGCCTTTGCCGGATTGCTACGTGGC  
ACCAAAACCGAAGTAGTGAAGTGTATTTCCAATGATCTCGAAGTGCCCGCCAGTGCGGAGATTGTGCTGGAAGGG  
TATATCGAACAAGGCGAAATGGCGCCAGAAGGACCGTATGGTGACCACACTGGTTACTATAACGAAGTCGATAGT  
TTCCCGGTATTTACCGTGACGCATATTACCCAGCGTGAAGATGCGATTTACCATTCCACCTATACCGGGCGTCCG  
CCAGATGAACCCGCGGTACTGGGAGTGGCGTTGAACGAAGTATTTGTTCCCATTTCTGCAAAAGCAGTTCCCGGAA  
ATTGTGCGATTTTTACCTGCCGCCGGAAGGCTGCTCTTATCGCCTGGCGGTAGTGACAATCAAAAAACAGTACGCC  
GGACACGCGAAGCGCGTCATGATGGGCGTCTGGTCTTCTTACGCCAGTTTATGTACACTAAATTTGTGATCGTT  
TGCGATGATGACGTTAACGCACGCGACTGGAACGATGTGATTTGGGCGATTACCACCCGTATGGACCCAGCGCGG  
GATACTGTTCTGGTAGAAAATACGCCTATTGATTATCTGGATTTTGCTCGCCTGTCTCCGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACGAATAAATGGCCGGGGGAAACCCAGCGTGAATGGGGACGTCCCATCAAAAAAGATCCA  
GATGTTGTGCGCACATATTGACGCCATCTGGGATGAACTGGCTATTTTTTAACAACGGTAAAAGCGCCTGA

**286. *Shigella flexneri* 2a str. 301 (SEQ ID NO. 286)**

ATGGACGCCATGAAATATAACGATTTACGCGACTTCCTGACGCTGCTTGAACAGCAGGGTGAGCTAAAACGTATC  
ACGCTCCCGGTGGATCCGCATCTGGAATCACTGAAATTGCTGACCGCACTCTGCGTGCTGGTGGGCCTGCGCTG  
TTGTTGCAAAACCCTAAAGGCTACTCAATGCCGGTGCTGTGCAACCTGTTCCGTACGCCAAAGCGCGTGCGATG  
GGCATGGGGCAGGAAGATGTTTCGACGCTGCGTGAAGTTGGTAAATTATTGGCGTTTCTGAAAGAGCCGGAGCCG  
CCAAAAGGTTTCCGCGACCTGTTTGATAAACTGCCGCAGTTTAAGCAGGTGTTAAACATGCCGACAAAGCGACTG  
CGTGGTGCGCCCTGCCAACAAAAAATCGTCTCTGGCGATGACGTGATCTCAATCGCATTTCCATTATGACCTGC  
TGCCCGGAAGATGCCGCGCCGCTGATTACCTGGGGGCTGACCGTAACGCGCGGCCCGCATAAAGAGCGGCAGAAT  
CTGGGCATTTATCGCCAGCAGCTGATTGGTAAAAACAACTGATTATGCGCTGGCTGTGCGATCGCGGCGGCGCG  
CTGGATTATCAGGAGTGGTGTGCGGCGCATCCGGGCGAACGTTTCCCGGTTTCTGTGGCGCTGGGTGCCGATCCT  
GCCACGATTCTCGGTGCAGTCACCCCGTTCCGGATACGCTTTCAGAGTATGCGTTTGCCGGATTGCTACGCGGC  
ACCAAAACCGAAGTAGTAAAGTGTATTTCCAATGACCTCGAAGTGCCAGCCAGTGCCGAAATCGTCTGGAAGGG  
TATATCGATCCTGGTGAGATGGCGCCGGAAGGGCCGTATGGTGACCACACAGGTTACTATAATGAAGTCGATAAT  
TTCCCGGTGTTTACCGTGACGCATATTACCCAGCGTGAAGATGCGATTTACCATTCCACCTATACCGGGCGTCCG  
CCAGATGAGCCCGCGGTACTGGGCGTGGCGTTGAACGAAGTGTGTTGTACCGATTCTGCAAAAACAGTTCCCGGAA  
ATTGTGCGATTTTTACCTGCCGCCGGAAGGCTGTTCTTATCGTCTGGCGGTAGTGACGATCAAAAAACAGTACGCC  
GGACACGCGAAGCGCGTCATGATGGGCGTCTGGTCTTCTTACGCCAGTTTATGTACACTAAATTTGTGATCGTT  
TGCGATGATGACGTCAACGCACGCGACTGGAACGATGTGATTTGGGCGATTACCACCCGTATGGACCCGGCGCGG  
GATACTGTTCTGGTAGAAAATACGCCTATTGATTATCTGGATTTTGCTCGCCTGTCTCTGGGCTGGGTTCAAAA  
ATGGGGCTGGATGCCACGAATAAATGGCCGGGGGAAACCCAGCGTGAATGGGGACGTCCCATCAAAAAAGATCCA  
GATGTTGTGCGCGCATATTGACGCCATCTGGGATGAACTGGCTATTTTTTAACAACGGTAAAAGCGCCTGA

**287. *Pseudomonas aeruginosa* PAO1 (SEQ ID NO. 287)**

ATGACGTTCAAGGATCTCCGCGATTTTCATCGCCCAGCTGGAGCAGCGCGGTGCGTTGAAGCGCATCCAGGTGCCG  
ATTTCCCCCGTGCTCGAGATGACCGAGGTGTGCGACCGCACGTTGCGCGCCAAGGGCCCGGCATTGCTGTTCGAA



AAGCCGACCGGCTTCGACATGCCGGTGCTCGGCAACCTGTTCCGGTACGCCGGAGCGCGTGCGCTGGGCATGGGC  
GCCGAGGACGTGCGCGCACTGCGCGAGATCGGCAAGCTGCTGGCGCAACTCAAGGAGCCCGAGCCGCCGAAGGGC  
CTCAAGGACGCCTGGGCCAAGCTGCCGATGTACAGGAAGGTCTGTCCATGGCGCCGAAGGTGCTCAAGGACGCC  
CCCTGCCAGGAAGTGGTTCGAGGAGGGCGAGGACGTGACCTCGGCCGGCTGCCGGTCCAGACCTGCTGGCCGGGC  
GATGTGCGGCCGCTGATCACCTGGGGCTGACCGTTACCCGCGGGCCGAACAAGGAACGGCAGAACCTGGGCATC  
TACCGCCAGCAGGTGATCGGCCGCAACAAGGTGATCATGCGCTGGCTCAGCCATCGCGGCGGGCGCACTGGACTAC  
CGCGAGTGGTGCCAGAAGCATCCGGGCCAGCCCTATCCGGTAGCCGTGGCGCTGGGCGCCGATCCGGCGACCATC  
CTCGGTGCGGTGACGCCGGTGCCGGACACCCTTTCCGAATACGCTTTCGCCGGCCTGTTGCGCGGGCATCGTACC  
GAGCTGGTCAAGTGTGCGCGGAGCGACTTGCAGGTGCCGGCCAGCGCCGAGATCGTCCTCGAAGGGGTGATCCAC  
CCCGGCGAGATGGCCGACGAAGGCCCTATGGCGATCACACCGGTACTACAACGAGGTGATCGCTTCCCGGTG  
TTCACCGTCGAGCGCTACCCGCCGGCAGAAACCGATCTACCACAGCACCTACACGGGGCTCCGCCGGACGAG  
CCGGCGATCCTCGGGGTGGCGCTGAACGAAGTGTTTCGTGCCGATCCTGCAGAAGCAGTTCCCGGAAATCGTCGAT  
TTCTACCTGCCGCCGGAAGGTTGTTTCTACCGGATGGCGGTGGTGACCATGAAGAAGCAGTACCCAGGGCACGCC  
AAGCGCGTGATGCTCGGGGTCTGGTTCCTGCGGCAGTTCATGTACACCAAGTTCGTATCGTACCGACGAT  
GACATCGATGCGCGCACTGGAACGATGTGATCTGGGCCATCACACCGGATGGACCCCAAGCGCGACACGGTG  
ATGATCGACAACACGCCCATCGACTACCTCGACTTCGCCTCGCCGTTTCCGGCCTCGGCTCGAAGATGGGGCTT  
GATGCCACCCACAAGTGGCCGGGCGAGACCAGCCGCAATGGGGGCGCGCCATCGTCAAGGACGAAGCGGTGACA  
CGGCGCATCGACGCCCTCTGGTCGAGCCTCGGGATCGACTGA

**288.      *Pseudomonas syringae* pv. *tomato* str. DC3000**  
**(SEQ ID NO. 288)**

ATGAAATTCAAAGATCTAAGGGATTTTCGTGCAGCAGTTGGAGCAGCGCGGAGAGTTGAAACGCATTTCAGATGCCG  
ATCTCGCCTGTGCTGGAAATGACTGAAATCTGTGACCGTACCTTGCGCGCCAAAGGCCCGGCCCTGCTGTTTGAA  
AACCCGGTTGGCTTTGATATTCCGGTGCTGGGCAACCTGTTCCGGCACGCCGAGCGCGTGGCCATGGGCATGGGC  
GCGGAAGCCGTCACCGAGCTGCGCGAAATCGGCAAGTTGCTTGCGTTTCTCAAGGAGCCCGAGCCGCCCAAAGGC  
CTGAAAGATGCCTGGTCCAAGCTGCCCATCTTCCGCAAAGTCATCGCCATGGCGCCCAAGGTGCTCAAGGATGCA  
CCCTGCCAGGAGATCGTCATCGAGGGTGATGACGTGATCTCGGCATGTTGCCGGTGCGAGACCTGCTGGCCGGGC  
GATGTGCGCGCCGCTGATCACCTGGGGCTGACCGTGACCAAAGGCCCGAACAAAGGAGCGGCAGAACCTCGGTATT  
TATCGCCAGCAGGTATCGGCCGCAACAAGATCATCATGCGCTGGCTCAGCCATCGCGGTGGCGCGCTTGACTTC  
CGCGACTGGTGCGTCAAGCATCCTGGCGAGCCTTATCCGGTGCCGTCGCACTGGGCGCGGACCCGGCGACCATT  
CTCGGTGCCGTGACGCCGGTGCCGACAGCCTGTCCGAATACGCCTTCGCCGGGCTACTGCGTGGCTCGCGCACC  
GAGCTGATCAAGTGCCGTGGCAGCAACCTGCAAGTGCCAGCCAGTGCCGAAATCGTGCTTGAGGGCGTGATTCAT  
CCGGGCGAGATGGCCAACGAAGGCCCTACGGCGATCACACCGGTTATTACAACGAAGTCGACAGCTTTCGGGTG  
CTACCGTCGAGCGCATACCCACCGCATCAAGCCGATCTACCACAGCACCTACACGGGGCTCCACCGGACGAG  
CCGGCTATCCTGGGTGTGGCGCTGAACGAAGTGTTTCGTGCCGATTCTGCAGAAGCAGTTTCCGGAAATCGTCGAT  
TTCTACCTGCCGCCCAGGGGTGCTCTTACCGCATGGCGGTGGTGACTATCAAGAAACAGTACCCCGGCCATGCC  
AAGCGCGTGATGCTGGGCGTCTGGTTCCTGCGCCAGTTTATGTACACCAAATTTGTGATCGTACCGATGAC  
GACATCAATGCGCGTGAATGACGTGATCTGGGCCATCACACCCGATGGACCCCAAGCGCGACACGGTC  
ATGATCGACAACACGCCCATCGATTACCTCGATTTTGCCTCTCCGGTGTCTGGATTGGGATCAAAAATGGGCCTG

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GATGCCACTAACAAATGGCCAGGGGAAACCACCCGCGAATGGGGCAGGGCGATCGTCAAGGACGAAGCCACCACG  
CGCCGGGTGGACGAGATCTGGACTCAGTTGGGAATAGACTGA

**289. *Yersinia pseudotuberculosis* IP 32953 (SEQ ID NO. 289)**

ATGATCAGCATGAAATACCGTGACTTACGTGACTTCCTCTCATTACTGGAACAGAGGGGGGAACCTTAAACGCATT  
AGCCAGCCCATTGATCCTTATTTGGAAATGACAGAAATTGCCGATCGCACGTTACGTGCTGGTGGGCCTGCGTTA  
CTTTTTGAGAACCCTAAAGGTTACAGCATGCCCGTGTTGTGTAATCTGTTTGGCACCGCTAAGCGAGTCGCCATG  
GGGATGGGGCAAGAAGATGTCAGCGCCCTGCGAGATGTTGGTAAATTATTGGCCTTCCTGAAAGAACCCGATCCC  
CCAAAAGGTTTCCGTGACTTATTTGATAAGCTGCCAAAATTTAAGCAGGTATTGAATATGCCAACGAAACGCTTG  
AACTCGGCCCCGTGTCAGGAGCAAGTTTGGCAAGGTGAGGATGTTGATTTAAGTCGCATCCCTGTGATGCACTGC  
TGGCCAGAAGATGCCGCACCACTAGTCTCTTGGGGGTTGACTATTACACGTGGTCCCCACAAAGAACGGCAGAAT  
CTAGGCATCTATCGCCAGCAGGTATTGGGTAAAAACAAATTAATTATGCGTTGGCTATCGCATCGTGGTGGTGCG  
CTGGATTATCAGGAGTGGTGTGAGGCACACCCCTGGTGAACGTTTTCCGGTCGCTGTCGCCTTGGGAGCAGACCCT  
GCTACGATCTTAGCCGCAGTGACCCCGGTACCAGACACGCTGTCTGAATATGCCTTTGCCGGCTTGTTACGCGGC  
CATAAACGGAAGTGGTGAAGTGTCTTTCCAATGACCTTGAAGTTCCTGCAAGTGCAGAAATTGTATTGGAAGGA  
TATATCGAACAAGGTGATATGGCTCCGGAAGGTCCTTATGGTGATCATACGGGCTATTACAATGAAATAGATAAT  
TTCCCCGTGTTTACCGTCACGCATATTACACAGCGCCAAGACGCAATTTATCATTCAACCTATACGGGCCGACCA  
CCGGATGAACCTGCGGTAATGGGGGTGGCACTGAACGAAGTCTTTGTACCTATTTTGCAAAGCAATTTCCCGGAA  
ATTGTTGATTTCTACTTGCCACCAGAAGGGTGCTCATACCGGTTGGCGGTGGTAACCATCAAGAAACAATATGCA  
GGCCATGCCAACGCGTGATGATGGGAGTATGGTCGTTTTTACGCCAGTTTATGTATACCAAGTTTGTTATTGTT  
TGTGATGACGATATTAATGCTCGTGATTGGAATGATGTAATTTGGGCGATCACCACCCGGATGGACCCATCCCGC  
GATACGGTGTTAATTGAAAATACACCGATAGATTATTTGGATTTGCCTCACCGGTTTCCGGTTTGGGATCGAAA  
ATGGGGCTGGATGCCACCAACAAATGGCCAGCAGAGACTCCGCGTGAATGGGGGCGTCCAATTAAGATGGACGAA  
GACGTCCGTGCCCCGTATTGATGCTCTGTGGGATGAGCTGGCCATTTTCAGTGACAAAGACGCGAAACGCTAA

**290. *Neisseria meningitidis* serogroup B strain MC58  
SEQ ID NO. 290)**

ATGAATATGAAATACAAAGACCTGCGCGACTTCATCGCCATGCTCGAGCAGCAGGGCAAACCTCAAGCGCGTCGCA  
CACCCCATTTCCTCGTATTTGGAAATGACCGAAATCGCCGACCGCGTGCTGCGTGCCGAAGGGCCGGCGTTGCTG  
TTTGAAAACCCGATTAAGCCCGACGGTACGCGCTACGGTTATCCCGTGTTGGCAAACCTGTTCCGGCACGCCCGAA  
CGTGTTGGCGATGGGCATGGGCGCGGACAGCGTGTCCAAGCTGCGTGAAATTGGGCAGACGCTGGCGTATTTGAAA  
GAACCCGAACCGCCCAAAGGCATCAAAGATGCGTTTTTCCAACCTGCCGCTGCTGAAAGACATTTGGAGCATGGCG  
CCGAACGTGGTGAAAAACGCGCCGTGTCAGGAAATCGTGTTGGGAAGGCGAAGACGTTGATTTGTATCAACTTCCG  
ATTCAGCATTGCTGGCCGGAAGACGTTGCGCCGCTGGTAACGTGGGGCTTGACCGTCACGCGCGGGCCGCACAAA  
AAACGCCAAAATCTCGGCATTTACCGCCAACAACCTCATCGGCAAAAAACAAGCTGATTATGCGTTGGCTGTGCGAT  
CGCGGCGGCGCGTTGGATTATCAGGAGTTCCGCAAACCTCAATCCCGATACGCCGTATCCCGTCGCCGTGCTACTC  
GGCTGCGACCCCGCCACCATTTTGGGCGCGGTAACGCCTGTTCCCGATACCTTGAGCGAATACCAGTTTGCCGGA  
CTGCTGCGCGGTTTCGCGGACGGAGCTGGTGAAATGTATCGGCAACGATTTGCAAGTGCCTGCCCGCGCAGAAATC  
GTGTTGGAAGGCGTCATCCATCCGAACGAAACCGCGTTGGAAGGCCCGTACGGCGACCACACCGGCTATTACAAC  
GAGCAGGATTATTTCCCTGTGTTTACGGTGAACGCATCACCATGCGCGAAAACCCGATTTACCATTTCGACCTAC

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ACGGGCAAACCGCCCGATGAACCCGCCGTTTTGGGCGTGGCGTTGAACGAAGTGTTTCGTACCGCTTTTGCAAAAG  
CAGTTCCCCGAAATCACCGATTTCTACCTGCCGCCGAAGGCTGCTCCTACCGCATGGCGGTGGTGAGCATGAAA  
AAACAGTACGCCGGACACGCCAAGCGCGTGATGATGGGCTGCTGGTCGTTTCCTGCGCCAGTTTATGTATACCAA  
TTCATCATCGTGGTGGATGACGATGTGAACGTGCGCGACTGGAAAGAAGTCATCTGGGCGGTACCCACGCGCATG  
GACCCCGTGCGCGACACTGTTTTGGTAGAAAACACGCCCATCGATTATCTCGACTTCGCCAGCCCCGTCAGCGGA  
CTCGGCGGCAAAATGGGTTTGGATGCGACCAACAAATGGCCGGGAGAAACCGACCGCGAATGGGGACGCGTCATC  
AAAAAGACCCCTGCGGTTACGGCTAAGATTGATGGGATTGGGAGGAATTGGGGTTGTAG

**291. *Neisseria gonorrhoeae* FA 1090 (SEQ ID NO. 291)**

ATGAAATACAAAGACCTGCGCGACTTCATCGCTATGCTCGAGCAGCAGGGCAAGCTCAAGCGCGTCGCCCACCCC  
GTTTCCCCGCATTTGGAAATGACCGAAATTGCCGACCGCGTGTTGCGCGCCGAAGGGCCGGCGTTGTTGTTTGAA  
AACCCGGTTAAGCCCGACGGTACGCGCTATGATTATCCCGTGTTGGCGAACCTGTTCCGGCACCCCCGAACGTGTG  
GCGATGGGCATGGGCGCGGACAGCGTGTCAGCTGCGCGAAATCGGGCAGACGCTGGCGTATTTGAAAGAACCC  
GAACCGCCCCAAGGCATCAAAGACGCGTTTTTCCAACTGCCGCTGTTGAAAGATATTTGGAGCATGGCGCCGAAC  
GTGGTGAAAAACGCGCCGTGTCAGGAAATCGTGTTGGGAAGGAGAAGACGTTGATTTGTATCAGCTTCCGATTCAA  
CATTGCTGGCCGGAAGACGTTGCGCCGCTGGTAACGTGGGGCTTGACCGTCACGCGCGGGCCGCACAAAAAACGC  
CAAAATCTCGGCATTTACCGTCAACAACATCATCGGCAAAAACAAGCTGGTTATGCGCTGGCTGTGCGATCGCGGC  
GGCGCGTTGGATTATCAGGAATTCGCAAACTCAATCCCGATACGCCGTATCCCGTCGCCGTCTGTAATCGGTTGC  
GACCCCTCCACCATTTTGGGCGCGGTAACGCCCGTTCCCGATACTTTGAGCGAATACCAGTTTGCCGGACTGCTG  
CGCGGTTGCGGACGGAGCTGGTGAAATGTATCGGCAGCGATTTGCAAGTGCCTGCCCGTGCTGAAATTGTATTG  
GAAGGCGTGATTATCCTCAAACGAAACCGCGTTGGAAGGCCCATACGGCGACCACACGGGCTATTACAACGAGCAG  
GGCCATTTCCCTGTGTTTACGGTGAACGCATCACCATGCGCGAAAACCCGATTTACCACTCTACCTACACAGGC  
AAACCGCCCGACGAACCTGCCGTTTTTGGGCGTGGCGTTGAACGAAGTGTTTCGTACCGCTTTTGCAAAAGCAGTTC  
TCCGAAATCACCGATTTCTACCTGCCGCCGAAGGCTGTTCTACCGCATGGCGGTGGTCAGCATGAAAAAACAG  
TACGCCGGACACGCCAAGCGCGTGATGACGGGCTGCTGGTCGTTTCCTGCGCCAGTTTATGTACACCAAATTCATC  
ATCGTGGTGGATGACGATGTAAACGTGCGCGACTGGAAAGAAGTCATCTGGGCGGTAACCACGCGCATGGACCCC  
GTCCGCGACACCGTTTTTGGTGGAAAACACGCCCATCGACTACCTCGACTTCGCCAGCCCCGTCAGCGGACTCGGC  
GGCAAAATGGGTTTGGATGCGACACAGCAAATGGCCGGGAGAAACCGACCGCGAATGGGGACGGGTAATCAAAAA  
GACCCTGCGGTTACGGTTAAATTTGATGGGATTGGGGGAAATTGGGGTTGTAG

**292. *Yersinia pestis* C092 (SEQ ID NO. 292)**

ATGATCAGCATGAAATACCGTGACTTACGTGACTTCCTCTCATTACTGGAACAGAGGGGGGAACCTAAACGCATT  
AGCCAGCCCATTGATCCTTATTTGGAAATGACAGAAATTGCCGATCGCACGTTACGTGCTGGTGGGCCTGCGTTA  
CTTTTTGAGAACCCTAAAGGTTACAGCATGCCCGTGTTGTGTAATCTGTTTGGCACCGCTAAGCGAGTCGCCATG  
GGGATGGGGCAAGAAGATGTCAGCGCCCTGCGAGATGTTGGTAAATTATTGGCCTTCCTGAAAGAACCCGATCCC  
CCAAAAGGTTTCCGTGACTTATTTGATAAGCTGCCAAAATTTAAGCAGGTATTGAATATGCCAACGAAACGCTTG  
AACTCGGCCCCGTGTCAGGAGCAAGTTTGGCAAGGTGAGGATGTTGATTTAAGTCGCATCCCTGTGATGCACTGC  
TGGCCAGAAGATGCCGCACCACTAGTCTCTTGGGGGTTGACTATTACACGTGGTCCCCACAAAGAACGGCAGAAT  
CTAGGCATCTATCGCCAGCAGGTATTGGGTAAAAACAAATTAATTATGCGTTGGCTATCGCATCGTGGTGGTGCG  
CTGGATTATCAGGAGTGGTGTGAGGCACACCCTGGTGAACGTTTTCCGGTCGCTGTGCGCTTGGGAGCAGACCCCT

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GCTACGATCTTAGCCGCAGTGACCCCGGTACCAGACACGCTGTCTGAATATGCCTTTGCCGGCTTGTTACGCGGC  
CATAAAACGGAAGTGGTGAAGTGTCTTTCCAATGACCTTGAAGTTCCTGCAAGTGCAGAAATTGTATTGGAAGGA  
TATATCGAACAAGGTGATATGGCTCCGGAAGGTCCTTATGGTGATCATACGGGCTATTACAATGAAATAGATAAT  
TTCCCGTGTTTACCGTCACGCATATTACACAGCGCCAAGACGCAATTTATCATTCAACCTATACGGGCCGACCA  
CCGGATGAACCTGCGGTAATGGGGGTGGCACTGAACGAAGTCTTTGTACCTATTTTGCAAAGCAATTCGCGGAA  
ATTGTTGATTTCTACTTGCCACCAGAAGGGTGCTCATACCGGTTGGCGGTGGTAACCATCAAGAAACAATATGCA  
GGCCATGCCAAACGCGTGATGATGGGAATATGGTCGTTTTTACGCCAGTTTATGTATACCAAGTTTGTTATTGTT  
TGTGATGACGATATTAATGCTCGTGATTGGAATGATGTAATTTGGGCGATCACCACCCGGATGGACCCATCCCGC  
GATACGGTGTTAATTGAAAATACACCGATAGATTATTTGGATTTGCGCTCACCGGTTTCCGGTTTGGGATCGAAA  
ATGGGGCTGGATGCCACCAACAAATGGCCAGCAGAGACTCCGCGTGAATGGGGGCGTCCAATTAAGATGGACGAA  
GACGTCCGTGCCCGTATTGATGCTCTGTGGGATGAGCTGGCCATTTTCAGTGACAAAGACGCGAAACGCTAA

**293. *Pseudomonas putida* KT2440 (SEQ ID NO. 293)**

TTGATTGGGGCCGCCTTGCGGCCCTTCGCGGGCAAGCCCGCTCCTGCACAGGTCATTGCGGCCCTTGTAGGAGCG  
GGCTTCCGCGAAGGGATGCAAAGCGGCCCCAATGCATTTTCACCCCAAACAAGGCCCGAACGGCGCTACACTCT  
GCACCCCGACCGATACGGCCAACACGAGGCTCCTGCATGCAGTATCGCGACTTGCGCGACTTCATTTCGTGGCCTG  
GAACAGCGCGCGAGCTCAAGCGCATCCAGGTACCGATCTCCCCGTCTGGAAATGACCGAGGTCTGCGACCGC  
ACCCTGCGCGCCAAGGGCCCGGCATTGTTGTTTCGAAAAGCCCACCGGCTTCGACATCCCAGTGCTGGGCAACCTG  
TTCGGTACCCCGAGCGGGTGGCCATGGGCATGGGCGCCGAGTCGGTCAGCGAACTGCGGGAAATCGGCAAGCTG  
CTGGCCTTCTCAAGGAGCCTGAGCCGCCCAAGGGCCTGAAGGACGCCTGGTCGAAGCTGCCGATCTTCAAGAAG  
GTCGTGTCGATGGCGCCAAAAGTGGTCAAGGACGCGGTGTGCCAGGAAGTGGTGGTCGAGGGTGACGATGTGAC  
CTTGGCACGCTGCCGATTTCAGCACTGCTGGCCTGGCGACGTGGCGCCGCTGATTACCTGGGGCCTCACCGTGACC  
CGTGGCCCGAACAAGGACCGCCAGAACCTGGGCATCTACCGCCAGCAGGTGATCGGCCGCAACAAGGTGATCATG  
CGCTGGCTCAGCCATCGTGGCGGCGCCCTCGATTACCGAGAGTGGTGCGAGAAGAACCCCGGCCAGCCGTTTCCG  
GTCGCCGTGGCCCTGGGCGCTGACCCAGCGACCATTTCTCGGCGCGGTGACCCCGGTCCCGGACACCCTTTCCGAG  
TACGCCTTCGCCGGCCTGCTGCGAGGCAATCGCACCGAGCTGGTCAAGTGCCGTGGCAGCAACCTGCAGGTACCG  
GCAACCGCCGAGATCATTTCTGGAAGGGGTGATCCACCCAGGCGAAATGGCCCCGGAAGGCCCTTACGGCGATCAC  
ACGGGCTACTACAACGAAGTGGACAGTTTCCCGGTGTTACCGTTGAGCGCATCACCCACGGGCAAAAACCGATC  
TACCACAGCACCTACACGGCCGCGCCGAGATGAGCCGGCCATTCTCGGCGTGGCGCTGAACGAAGTGTTTCGTG  
CCGATCCTGCAGAAGCAGTTCCCGGAAATCACCGACTTCTACCTGCCGCCGGAAGGCTGCTCGTACCGCATGGCG  
GTGGTGACCATGAAGAAACAGTACCCAGGCCACGCCAAGCGCGTAATGCTGGGTGTGTGGTCGTTCTGCGACAG  
TTCATGTACACCAAGTTCGTTATTGTACCGATGACGATATCAACGCTCGTGACTGGAACGATGTGATCTGGGCC  
ATTACCACGCGCATGGACCCCAAGCGTGATACGGTAATGATTGACAATACCCCGATCGACTACCTGGACTTTGCG  
TCACCGGTGTGCGGGCTGGGTTCGAAGATGGGCCTGGACGCTACGCACAAGTGGCCGGGCGAGACTACACGCGAA  
TGGGGCCGGGTTCATCGTCAAGGATGAGGCCGTACCCGCCGTATCGATGAGCTGTGGGATCAGTTGGGAATAGAT  
TGA

**294. *Serratia marcescens* ATCC 13880 (SEQ ID NO. 294)**

CAGACGCCCATCATCACGCGTTTCGCATGGCCGGCGTACTGTTTTTTCATGGTCACTACCGCCAGGCGGTAAGAG  
CACCCCTCCGGCGGCAGATAGAAATCGACGATTTCCGGGAAGTCTTTTGCAGGATCGGTACGAACACTTCATTC

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AGCGCCACGCCCAGGATCGCCGGCTCATCCGGCGGGCGGCCGGTGTAGGTGAGTGGTAGATCGCGTTGCGGCGC  
TGGGTGATGTGAGTAACGGTGAACACCGGGAACCTGGTCGATTTTCATTGTAGTAACCGGTGTGGTCGCCGTAGGGG  
CCTTCCGGCGCCATTTACCCGGCTCGATATAGCCTTCAAGCACGATTTTCGGCGCTGGCGGGCACTTCCAGATCG  
TTGGAAGGCACTTGACCACTTCGGTTTTGTTGCCGCGCAGCAACCCGGCAAAGGCGTATTCGGACAAGGTATCA  
GGCACCGGCGTGACCGCACCGAGGATGGTAGCAGGATCGGCGCCCAGCGCCACCGCAACCGGGAAACGCTCGCCC  
GGGTGCGCCTGGCACCACTCCTGATAATCCAGCGCGCCGCCGCGATGCGACAGCCAACGCAT

**295. *Burkholderia mallei* ATCC 23344 (SEQ ID NO. 295)**

ATGAAATACAGAGATTTACGCGATTTTCATCCATGGCCTCGAGCAGCGCGCGAGTTGCGGCGCGTCACCCAGCCC  
GTATCGCCCGTCCTCGAAATGACCGAACTCTGCGACCGCGTGCTGCGCGCGGGCGGCCCGCACTCCTGTTTCGAC  
GCGCCGGCCGGCCACCGGTTTCCGGTGCTCGGCAATCTGTTGCGCACGCCGCGGCGCGTTCGCGCTCGGCATGGGC  
GTCGACGCCGACGACGAAGCGGCGCTCGCGTCGCTGCGCGACATCGGCCGCCTGCTGTCCGCGCTCAAGGAGCCG  
GACCCGCCGAAGCGCCTGAAAGACGCGGGCAAGTTGCTGTGCTCGCGAAGGCCGTGTGGGACATGGGCCCGAAG  
ACGGTCTCCGCGCCGCCGTGCCAGGAGATCGTCTGGGAAGGCGACGACGTCGATCTGCACAAGCTGCCGATCCAG  
ACCTGCTGGCCGGGCGACGCCGGGCCGTGCTCACGTGGGGCCTGACCGTCACGCGCGGGCCGAACAAGACGCGC  
CAGAATCTGGGCATCTACCGGCAGCAACTGATCGGACGCAACAACTGATCATGCGCTGGCTCGCGCATCGCGGC  
GGCGCGCTCGATTTCCGCGAATTCGCGCTGAAGCATCCGGGCCAGCCCTATCCCGTCGCCGTGCTGCTCGGCGCC  
GATCCGGCGACGATGCTCGGGGCCGTACGCCCCGTGCCCGATTTCGCTGTCCGAATACCAGTTTCGCGGGCCTGCTG  
CGCGGCGCGCGCACCGAGCTCGCGAAATGCGTGACGCCCGGCGTCGACGCGCTGCAGGTGCCGGCGCGCGCGGAA  
ATCGTGCTCGAAGGCTTCATCCACCCGAGCAAGGCGCGCCGCGCGGCCGAAGGCGCGCCGCCGCGGCCG  
GCCGCGGGCGCGCGCGGCCGGCTACGAGCATGCGCTCGAGGGCCCGTACGGCGATCACACCGGCTACTACAACGAG  
CAGGAATGGTTTTCCGGTCTTACGGTCGAGCGGATCACGATGCGCCGCGATGCGATCTACCACTCGACGTACACC  
GGCAAGCCGCCGACGAGCCGGCCGTGCTCGGCGTCGCGCTGAACGAAGTGTTTCGTGCCGTGCTGCAGAAGCAG  
TTCGCCGAGATCACCGATTTCTATCTGCCGCCGAGGGTTGCAGCTACCGGATGGCGATCGTCCAGATGAAGAAG  
AGTTACGCGGGACACGCGAAGCGGGTGATGTTTCGGCGTCTGGAGCTTCCTGCGGCAGTTTCATGTATACGAAGTTC  
ATCGTGCTGTCGACGAGGACGTGAACGTGCGCGACTGGAAGGAAGTGATCTGGGCGATCACGACGCGCGTCGAT  
CCGGCGCGGACACGGTGCTCGTCGAGAACACGCCGATCGACTATCTCGACTTCGCGTCGCCCGTCGCCGGCCTC  
GGCTCGAAGATGGGGCTCGATGCGACCAACAAGTGCGCGGGCGAAACCCAGCGCAATGGGGCCGGCCGATCGAG  
ATGGACGCCCGCGTGAAGGCGCGCTCGATCGTCTGTGGACGGAGATCGGCCTATCGTGA

**296. *Burkholderia pseudomallei* K96243 (SEQ ID NO. 296)**

ATGAAATACAAAGATTTACGCGATTTTCATCCATGGCCTCGAGCAGCGCGGCGAGTTGCGGCGCGTCACCCAGCCC  
GTATCGCCCGTCCTCGAAATGACCGAACTCTGCGACCGCGTGCTGCGCGCGGGCGGCCCGCGCTCCTGTTTCGAC  
GCGCCGGCCGGCCACCGGTTTCCGGTGCTCGGCAATCTGTTGCGCACGCCGCGGCGCGTTCGCGCTCGGCATGGGC  
GTCGACGCCGACGACGAAGCGGCGCTCGCGTCGCTGCGCGACATCGGCCGCCTGCTGTCCGCGCTCAAGGAGCCG  
GACCCGCCGAAGCGCCTGAAGGACGCGGGCAAGTTGCTGTGCTCGCGAAGGCCGTGTGGGACATGAGCCCGAAG  
ACGGTCTCCGCGCCGCCGTGCCAGGAGATCGTCTGGGAAGGCGACGACGTCGATCTGCACAAGCTGCCGATCCAG  
ACCTGCTGGCCGGGCGACGCCGGGCCGTGCTCACGTGGGGCCTGACCGTCACGCGCGGGCCGAACAAGACGCGC  
CAGAATCTGGGCATCTACCGGCAGCAACTGATCGGACGCAACAACTGATCATGCGCTGGCTCGCGCATCGCGGC  
GGCGCGCTCGATTTCCGCGAATTCGCGCTGAAGCATCCGGGCCAGCCCTATCCCGTCGCCGTGCTGCTCGGCGCC

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GATCCGGCGACGATGCTCGGGGCCGTACGCCCCGTGCCCGATTGCTGTCCGAATACCAGTTCGCGGGCCTGCTG  
CGCGGCGCGCGCACCGAACTCGCGAAATGCGTGACGCCCCGGCGTCGACGCGCTGCAGGTGCCGGCGCGCGCGAA  
ATCGTGCTCGAAGGCTTCATCCACCCGAGCAAGGCGCGCCCGCGCCGGCGCCGAAGGCGCGCCGCCGCGGCCG  
GCCGCGGGCGCGGGCGGCCGGCTACGAGCATGCGCTCGAGGGCCCGTACGGCGATCACACCGGCTACTACAACGAG  
CAGGAATGGTTTCCGGTCTTCACGGTCGAGCGGATCACGATGCGCCGCGATGCGATCTACCACTCGACGTACACC  
GGCAAGCCGCCCGACGAGCCGGCCGTGCTCGGCGTCGCGCTGAACGAAGTGTTGCTGCCGCTGCTGCAGAAAGCAG  
TTCGCCGAGATCACCGATTTCTATCTGCCGCCGAGGGTTGCAGCTACCGGATGGCGATCGTCCAGATGAAGAAG  
AGTTACGCGGGACACGCGAAGCGGGTGATGTTGCGCGTCTGGAGCTTCCTGCGGCAGTTCATGTATACGAAGTTC  
ATCGTGGTCGTCGACGAGGACGTGAACGTGCGCGACTGGAAGGAAGTGATCTGGGCGATCACGACGCGCGTCGAT  
CCGGCGCGCGACACGGTGCTCGTCGAGAACACGCCGATCGACTATCTCGACTTCGCTTCGCCCCGTGCGCCGGCCTC  
GGCTCGAAGATGGGGCTCGATGCGACCAACAAGTGCCCGGGCGAAACCCAGCGCGAATGGGGCCGGCCGATCGAG  
ATGGACGCCGCCGTGAAGGCGCGCGTCGATCGTCTGTGGACGGAGATCGGCCTGTCGTGA

**297. *Bordetella parapertussis* (SEQ ID NO. 297)**

TTGAAGTATCGCGACCTCCGAGATTTTCTTGCCCAGCTTGAACGCCAGGGCGAACTCAAACGCATCACCGCGCCG  
GTCTCGACGCGGCTGGAAATGACCGAGATTGCCGACCGGGTGCTGCGCGCCGGCGGCCCGGCCCTGCTGTTTCGAG  
AACGCCCCGCCACAACGACGCGCCGGCCGACATGCCGGTGCTGGCCAACCTGTTGCGCACGCCGCGGGGTCGCC  
TGGGGCATGGGGGCCGACGACGTGCGCGCCCTGCGCGAAACCGGCCAACTGCTGGCCTCCCTGCGCGAGCCCGAA  
GCGCCCCAAGGGCCTGCGCGACGCGCTGGCCAAGGTGTCCATGCTGAAAGCCGCCCTGTGGGACATGAGCCCCAAG  
ACCGTGCGCAGCGCCGCTGCCAGGAAATCGTCTGGGAAGGCGCGACGTGACCTGGGCGCCTGCCCATCCAG  
ACCTGCTGGCCGGGCGATGTGGCGCCCTGCTCGCCTGGGGCCTGGTGATCACGCGCGGGCCGAACGCCCGGCGG  
CAGAACCTGGGTATCTACCGCCAGCAGCCGCTGGGGCCGAACAAGCTGATCATGCGCTGGCTGTGCGACCGCGGC  
GGCGCGCTGGACTTCCGCGACACGCCCAGGCCACCCGGGCAAGTCGTTTCCCATCGCCGTGGCGCTGGGTGCC  
GACCCGGCCACCATCCTGGACGCGGTACGCCGGTGCCGGACACGCTGTCCGAATACCAGTTCGCCGGGCTGCTG  
CGCGGCTCGCGCACCGAGGTGCTCAAGGCGCTGGGCAGCGACCTGTGCGTGCCGGCCTCGGCCGAGATCGTGCTC  
GAGGGCCACCTGCTGCCGGCCGACGATCCGCGCGCCGTGCTGCCGCGGTGCCCGAGGGCGCAACCCGCCCCCG  
GCCACCGGCTACGAAATGGCCCTCGAAGGCCCTATGGCGACCATAACGGCTACTACAACGAGCAGGACTGGTTC  
CCGGTGTTACGGTGGACCGCATACCATGCGGGCAACCCCATCTACCACTCCACCTATACCGGCAAGCCGCCC  
GACGAGCCGGCCGTGCTGGGCGTGCGCTGAACGAGGTATTCGTGCCGCTGCTGCGCCGCCAGCTGCCCGAAATC  
GTCGATTTCTACCTGCCCCCGGAAGGCTGCAGCTACCGCCTGGCGGTGGTGTCGATCCGCAAGCAGTACGCCGGC  
CACGCCAAGCGCGTGATGTTGCGCCTGTGGAGCGTGCTGCGGCAGTTCATGTACACCAAGTTCATCGTGGTGGTC  
GACGAAGACATCGACCCGCGCGACTGGACCGAAGTGGTCTGGGCCATGACCACGCGCATGGACCCCGTGCGCGAC  
ACGGTGCTGGTCGAGAACACGCCGATCGATTACCTCGATTTGCCTCGCCGGTGTCGGGCTGGGCGGCAAGATG  
GGGCTGGACGCCACCAACAAGTGCCCGGGCGAAACCCAGCCGCGAATGGGGCACGCCCATACACATGGACGAGGCG  
GTCAAGCGCCGGGTGGATGCCATGTGGGACACGCTGGGACTGTAG

**298. *Bordetella bronchiseptica* RB50 (SEQ ID NO. 298)**

TTGAAGTATCGCGACCTCCGAGATTTTCTTGCCCAGCTTGAACGCCAGGGCGAACTCAAACGCATCACCGCGCCG  
GTCTCGACGCGGCTGGAAATGACCGAGATTGCCGACCGGGTGCTGCGCGCCGGCGGCCCGGCCCTGCTGTTTCGAG  
AACGCCCCGCCACAACGACGCGCCGGCCGACATGCCGGTGCTGGCCAACCTGTTGCGCACGCCGCGGGGTCGCC

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TGGGGCATGGGGGCCGACGACGTGCGCGCCCTGCGCGAAACCGGCGAACTGCTGGCCTCCCTGCGCGAGCCCGAA  
GCGCCCAAGGGCCTGCGCGACGCGCTGGCCAAGGTGTCCATGCTGAAAGCCGCCCTGTGGGACATGAGCCCCAAG  
ACCGTGCGCAGCGCCGCTGCCAGGAAATCGTCTGGGAAGGCGCCGACGTGACCTGGGCGCCTGCCCATCCAG  
ACCTGCTGGCCGGGCGATGTGGCGCCCCCTGCTCGCCTGGGGCCTGGTGATCACGCGCGGGCCGAACGCCCGGCGG  
CAGAACCTGGGTATCTACCGCCAGCAGCCGCTGGGGCCGAACAAGCTGATCATGCGCTGGCTGTGCGACCGCGGC  
GGCGCGCTGGACTTCCGCGACCACGCCCAGGCCACCCGGGCAAGCCGTTTCCCATCGCCGTGGCGCTGGGTGCC  
GACCCGGCCACCATCCTGGGCGCGGTACGCGCGGTGCCGGACACGCTGTCCGAATACCAGTTCGCCGGGCTGCTG  
CGCGGCTCGCGCACCGAGGTGCTCAAGGCGCTGGGCAGCGACCTGTGCGTGCCGGCCTCGGCCGAGATCGTGCTC  
GAGGGCCACCTGCTGCCGGCCGACGATCCGCGCGCCGTGCTGCCGCGGTGCCGAGGGCGCCAACCCGCCCCCG  
GCCACCGGCTACGAAATGGCCCTCGAAGGCCCTATGGCGACCATAACCGGCTACTACAACGAGCAGGACTGGTTC  
CCGGTGTTCACGGTGGACCGCATCACCATGCGGCGCAACCCATCTACCACTCCACCTATACCGGCAAGCCGCCC  
GACGAGCCGGCCGTGCTGGGCGTGGCGCTGAACGAGGTATTCGTGCCGTGCTGCGCCGCCAGCTGCCCGAAATC  
GTCGATTTCTACCTGCCCCCGGAAGGCTGCAGCTACCGCCTGGCGGTGGTGTGATCCGCAAGCAGTACGCCGGC  
CACGCCAAGCGCGTGATGTTGCGCCTGTGGAGCGTGCTGCGGCAGTTCATGTACACCAAGTTCATCGTGGTGGTC  
GACGAAGACATCGACCCGCGCGACTGGACCGAAGTGGTCTGGGCCATGACCACGCGCATGGACCCCGTGCGCGAC  
ACGGTGCTGGTTCGAGAACACGCCGATCGATTACCTCGATTTGCGCTCGCCGGTGTCCGGCCTGGGCGGCAAGATG  
GGGCTGGACGCCACCAACAAGTGGCCGGGCGAAACCAGCCGCGAATGGGGCACGCCCATACACATGGACGAGGCG  
GTCAAGCGCCGGGTGGATGCCATGTGGGACACGCTGGGACTGTAG

**299. *Bordetella pertussis* Tohama I (SEQ ID NO. 299)**

TTGCCGGGATCTGCCTTGAAGTACCGCGACCTCCGAGATTTTCTTGCCCAGCTCGAACGCCAGGGCGAACTCAAA  
CGCATACCGCGCCGGTCTCGACGCGGCTGGAAATGACCGAGATTGCCGACCGGGTGTGCGCGCCGGCGGGCCCG  
GCCCTGCTGTTTCGAGAACGCCCCGCCACAACGACGCGCCGGCCGACATGCCGGTGTGGCCAACCTGTTTCGGCAGC  
CCGCGGCGGGTGCCTGGGGCATGGGGGCCGACGACGTGCGCGCCCTGCGCGAAACCGGCGAACTGCTGGCCTCC  
CTGCGCGAGCCCGAAGCGCCCAAGGGCCTGCGCGACGCGCTGGCCAAGGTGTCCATGCTGAAAGCCGCCCTGTGG  
GACATGAGCCCCAAGACCGTGCAGCGCGCCCTGCCAGGAAATCGTCTGGGAAGGCGCCGACGTGAGCTGAGC  
CGCCTGCCCATCCAGACCTGCTGGCCGGGCGACGTGGCGCCCTGCTCGCCTGGGGCCTGGTGATCACGCGCGGG  
CCGAACGCCGGCGGCGAGAACCTGGGCATCTACCGCCAGCAGCCGTGGGGCCGAACAAGCTGATCATGCGCTGG  
CTGTGCGACCGGGGCGGCGCGCTGGACTTCCGCGACCACGCCAGGCCACCCGGGCAAGCCGTTTCCCATCACC  
GTGGCGCTGGGCGCCGACCCGGCCACCATCCTGGGCGCGGTACGCCGGTGCCGGACACGCTGTCCGAATACCAG  
TTCGCCGGGTGCTGCGCGGCTCGCGCACCGAGGTGCTCAAGGCGCTGGGCAGCGACCTGTGCGGTGCCGGCCTCG  
GCCGAGATCGTGCTCGAGGGCCACCTGCTGCCGGCCGACGATCCGCGCGCCGTGCTGCCGTGGTGCCGAGGGC  
GCCAACCCGCCCCCGGCCACCGGCTACGAAATGGCGCTCGAAGGCCCTATGGCGACCATAACGGCTACTACAAC  
GAGCAGGACTGGTTCCCGGTGTTACGGTGGACCGCATCACCATGCGGCGCAACCCCATCTACCACTCCACCTAT  
ACCGGCAAGCCGCCCCGACGAGCCGGCCGTGCTGGGCGTGGCGCTGAACGAGGTATTCGTGCCGTGCTGCGCCGC  
CAGCTGCCCCGAGATCGTCGATTTCTACCTGCCCCCGGAAGGCTGCAGCTACCGCCTGGCGGTGGTGTGATCCGC  
AAGCAGTACGCCGGCCACGCCAAGCGCGTGATGTTGCGCCTGTGGAGCGTGCTGCGGCAGTTCATGTACACCAAG  
TTCATCGTGGTGGTTCGACGAAGACATCGACCCGCGCGACTGGACCGAAGTGGTCTGGGCCATGACCACGCGCATG  
GACCCCGTGCGCGACACGGTGTGCTGGTTCGAGAACGCGCCTATCGATTACCTGGATTTGCGCTCGCCGGTGTCCGGC

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CTGGGCGGCAAGATGGGGCTGGACGCCACCAACAAGTGGCCGGGCGAAACCAGCCGGAATGGGGCACGCCCAT  
CACATGGACGAAGCGGTCAAGCGCCGGGTGGATGCCATGTGGGACACGCTGGGACTGTAG

**300. *Legionella pneumophila subsp. pneumophila str. Philadelphia 1***

**(SEQ ID NO. 300)**

ATGAAGTATTCTAGATCTGAGAGATTTTCATAGCCCAACTTGAATCACGTGAATTATTTAAACGTATTGATTATCCT  
GTATCACCTCATCTTGAGATGACCCTAGTCAGCGATAAAGTGTGCGCTCAGGAGGGCCAGCCCTTCTGTTTACC  
AATACCCCAATTACAACATGCCTGTACTGACCAATCTTTTTGGTACGGTAGAGCGCGTGGCTTTGGGAATGGGT  
GAGGAATCAATAGTGGCTTTGAGGGAGATTGGAAAATTATTGGCTGCTTTAAAGGAGCCCGATCCTCCCAAAGGC  
TTCAAAGACGCTTTTAGCAAGTTGCCCTTATTGAAACAAGCGCTGAATATGGCACCCAAATATGTCAGTGGAGCC  
GAGTGCCAGACTCATGTGTGGGAAAAGGATGAAGTGGATTTAACCTTATTGCCCATCCAAACGTGTTGGCCCGGA  
GATGTTGCTCCTCTAATTACCTGGGGTTTGGTTACTACTCGTGGCCACACCAGTCCAGAGAAAACATGGGCATC  
TATCGCCAGCAACTATTAAGTAAAAACAAATTGATCATGCGCTGGTTATCTCACCGCGGAGGTGCTTTGGATTAC  
CAGGCCTGGCAACAAGAATATCCCAAAGAGCGTTTCCCTGTTGCGGTGACTTTAGGCGCTGATCCAGCCACCATA  
CTGGCAGCAGTTACTCCCGTTCCTGATACTTTGTCTGAATACGCTTTTGCGGGCTTGCTTAGAGGACAACGAACT  
CGGTTGACTCGATGCATTGGCAATGATTTGCATGTTCCAGCCAGCGCAGAAATTGTTTTGGAAGGTTATCTGGAG  
CCAGGAAATGAGGCGCCCGAAGGGCCTTATGGCGATCACACCGGTTATTATAATGAAGTCCAATCTTTTCTGT  
TTTACGGTAGAGCGTATTACTCATCGCGATAAACCTATTTACCACAGTACTTATACCGGAAGACCGCCAGATGAG  
CCAGCCATTTTGGGAGTTGCCTTAAATGAAGTGTTCATTCCTTGTACAAAAACAATTCAGAGATTGTGGAT  
TTTTATTTGCCGCCAGAAGGATGCTCTTATCGTTTGGCTGTAGTCACTATAAAAAAGCAATATCCAGGACATGCT  
AAACGTATTATGATGGCTGTTTGGTCTTTCTTGCGCCAGTTTATGTATACCAAGTTCGTCAATTGTTTGTGATGAT  
GATGTGGACGCGCGCAATTGGCAAGATGTCATATGGGCAATGACCACACGCATGGATCCGTCCCGCGATACAGTC  
ATGGTAGAAAATACCCCATTTGATTATCTGGACTTCGCTTCCCCAGTTTCAGGATTGGGTTCAGATGGGTATG  
GATGCTACCAGTAAATGGCCAGGAGAAACACAAAGAGAATGGGGTAAACCAATTACGATGGATGAAGATGTGCTT  
AATAGAGTAAATGGTTATTGGTCCTTATTAGGATTTAAATAA

**301. *Klebsiella pneumoniae ATCC 13883* (SEQ ID NO. 301)**

AATGGCGCAGGAACGACCAGACGCCCATCATTACGCGCTTGGCATGTCCCGCTACTGTTTTTTCATGGTCACCA  
CCGCCAGGCGATAGGAGCACCTTCCGGCGGCAGATAGAAATCAACGATTTCCGGGAAGTCTTTTGCAGGATCG  
GCACAAAGACTTCATTCAGCGCCACGCCCAGCACCGCTGGCTCATCGGGCGGTCCGCCGGTATAGGTAGAATGAT  
AAATCGCGTCTTCACGCTGGGTAATATGGGTACCCTAAATACCGGAAGCTGTCCACTTCATTATAGTAACCGG  
TGTGATCGCCATACGGGCCTTCCGGCGCCATTTACCGGCCCTCAATGTAGCCTTCAAGCACAAATTTCCGCGCTGG  
CCGGCACTTCAAGGTCATTGGAAACGCACTTAACCACTTCGGTCTTGGTGCCGCGCAGCAGGCCTGCGAAAGCAT  
ATTCCGACAGGGTATCGGGCACCGGCGTCAACCGCGCAAGAATGGTTGCCGGATCGGGCGCAAGCGCCACGGAAA  
CCGGGAAGCGTTCGCCCCGACGCGCCGCGCACCACTCCTGGAAATCCAGCGCGCCGCGCGATGAGACAGCCA



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**302. *Serratia liquefaciens* ATCC 27592 (SEQ ID NO. 302)**

CCCATCATTACGCGTTTAGCATGACCAGCATACTGTTTCTTGATGGTCACCACCGCCAGACGATAAGAACAGCCT  
TCGGGCGGCAGATAGAAATCGACAATTTCCGGGAACTGCTTTTGCAGAATGGGAACGAAGACTTCGTTTCAGCGCC  
ACGCCCAGCACCGCAGGCTCATCCGGCGGACGGCCGGTGTAGGTTCGAGTGGTAAATGGCATCGCGACGCTGGGTG  
ATGTGAGTGATGGTAAATACCGGGAAGTGGTCGATCTCGTTGTAGTAACCGGTGTGATCGCCATACGGGCCTTCC  
GGTGCCATTTACCCGGTTCAATGTAGCCTTCCAACACGATTTCCGCGCTGGCCGGCACTTCCAAATCGCAGGAG  
AGGCACTTGACCACTTCGGTTTTGTTGCCACGCAGCAGCCCCGGCAAAAGCATATTCAGACAGGGTATCCGGTACC  
GGCGTCACCGCGCCGAGGATAGTGGCGGGATCCGCCCTAATGCCACCGCAACCGGGAAACGCTCACCAGGGTGC  
GCCTGACACCATTCTGATAATCCAACGCGCCGCCACGGTGGGACAGCCAACT

**303. *Brucella melitensis* (SEQ ID NO. 303)**

CCCGAAGCACCCGAAACACCGATGACGATCCGCTTCATATCCGTTTGTCCCTGTCGAGGCCGAGTTCATCCCAGA  
TCGCGTCCACACGGGCGATGGTTTCTTCATTCATGGCCAGAACCTTGCCCCATTCGCGGTCCGTTTCAGGACCGA  
TCTTGTTGGTGGCGTCAAGACCGAGCTTTCCGCCAAGGCCGGAGCGTGGCGAGGCCGAAATCCAGATAATCGACCG  
GCGTGTGCGAAAGTGTACACACGTCGCGGCTTGTCATCAAAGCGGGTGGCAAGCGCCACATCACATCGTCCCAGT  
TGTGTACATCGATATCGGGATCGACGGCGATAATGAGCTTGGTATAGCTGAACTGCGGCAGCATGGACCAAAGCC  
CCATCATCACGCGCCGCGCCTGCCCCGATAACGCTTGTCGATGGAAACCACCATGGCGCGGTAGGAACAGGCGG  
CAGGCGGCAGCCAGAGATCGGCTATCTCGGGAACTGCTTGCGCACGACAGGCACGAAAAGCTGGTTCATCACCT  
CGCCAAGCCGCGAAGGCTCGTCCGGCGGGCGCTCCGTATAGGTGGAAAGATAGACCGGCTTCTTGCGCATGGTGA  
TCGCCGTACCTGCATGACGGGAAACGCTCCACGCTGTTATAATAGCCGGTATGGTCCCCATAAGGCCCTTCGG  
GCGCGGTTTGTGTAGCGGAAACCCGACCTTCAAGAACGATTTCTGCATTGGCGGGCACCATCAGCGGCACCGTGC  
GCCCCGTGCGTGACACACGGCCTGCGCCCGCCAGAAGGCCGGAAAATGCAAGCTCGCTCATGCCTTCCGGCAGCG  
GCATAACTGCGGCCAGAATGGTCGCCGGGTCAACGCCGATGGCAATTGCAACCGGCATGTCCTCACC GCGCTTTT  
GCCACATGCGATGGTGGCGCGCGCCCGCGATGCGCGAGCCAGCGCATGATAAGCCGGTTCTCTCCAGTTTCT  
GCATCCGGTAAATGCCGACATTGACATCGGAGGGATCGTCCGGCGCGCGTGTGATAACGAGCGGCCAGGTGATGA  
GCGGCGCAGGCTCGCCCGGCCAGCACCATTTGGATCGGCAGCGTGTGAGATTGACCGATGCGCCTTCCATCACAA  
GGCCATGAACCGGCGCCCGGCTCACCTGGCGCGGGCGCATGTTGAGGGCTGCCTTGCCATCGGCAGCTTTTCCC  
ATATTTACCGGCCGAACGCGGCGGCTTCGGCGCACGCAATTCGGCCAGCATTTTCAGCCAGAAGCGGCAATTCCT  
CCGGCAGACGCCCAAGCCCCCAGGCGATACGCCGCTCGGACCCGA

**Figure 13. Molecular marker VIII (hypothetical protein yleA) in Gram-negative bacteria (SEQ ID NOs 304-325).**

**304. *Haemophilus influenzae* (SEQ ID NO. 304)**

TTAGCCGTGATAACGCCCTACGCCTAATTCATCTTCTTTACGTGTGCGATTTCATCACTTCTTGTGGAGATTGCGC  
AATACGTAATCCCATTTTCATCTTCAGTACGCACCACTTCGCCACGTAACGAATTAGTATAAACATCAGTGATTTT  
CACATCCACAACTTACCGATCATTTCTGGAGAACCTTGGAATTAACAATACGATTCGTTTCAGTACGTCCCGT  
CAATTCATAATATCTTTCTTCGATGGGCCTTCACTAACACGCGCTGCTCTGTGCCAAGCATACGACGGCTAAA  
TTGTGCCGCTTGTTGATTAATACGCTCTTGATGACATATAAGACGCTGTTTCTTTTCATCTCCGTGACATCATC  
TGGCATATCTGCTGCTGGCGTACCTGGTGGGGCTGAGTACACAAAAGTGAAGCTCATATCAAAGTTTACTTGTGC  
AATCAAATTCATAGTTTGTCTCAAATCTTCGCCGCTTTCACCAGGGAAACCAACAATAAAGTCAGAGCTGATTTG  
AATATCTGGGCGCACAGCACGAAGTTTACGAATAATGGATTTATATTCTAATGCGGTATGAGCACGTTTCATCAT  
TGTTAATACACGGTCAGAACCTGCTTGCACTGGAAGATGTAAGAACTCACTAATTCAGGCGTATCACGATACAC  
ATCAATAATATCATCGGTAAATTTCTATTGGATGACTGGTTGTGAAACGTAAACGGTCAATACCATCAATTGATGC  
GACAAGACGAAGCAACTCAGCAAAGCTGCAAATTTGACCATCATGCGTTGGCCACGATAAGCATTTCATTTTG  
ACCAAGTAGATTGACCTCACGCACACCTTGTTCCGCAAGTTGCGCAATTTCAAATAGCACATCATCTACAGGACG  
GCTAAGTTCTTCTCCACGAGTATAAGGCACAACACAAAAGTACAGTATTTATTACAGCCTTCCATAATGGAAAC  
AAATGCCGTTGGGCCTTCTGCGCGAGGTTCTGGTAAGCGGTCAAATTTCTCAATTTTCAGGGAACTTACGTCTAC  
GACGGAACTTTTTCCACCACGAATTTGATTAATCATTTTCAGGCAAGCGATGCAAAGTTTGCGGGCCAAAAATAAT  
ATCCACATAAGGCGCACGATGGCGAATATGTTCCCCTTCTTGAGAGGCTACACAGCCGCCACACCAATCACTAA  
ATTTGGATTATTTTTCTTTAATTCTTTCCAACGCCCAAGTTGGTGGAACACTTTTTCTTGCTTTTTTCACGAAT  
AGAACAGGTATTTAATAATAATACGTCTGCTTCTTCAGGTGCTTCCGTGAGTTCTAATCCGTGGGTGCTTAATAA  
AAGATCAGCCATTTTAGATGAATCATATTCATTCATCTGGCAGCCCCAAGTTTTAATATGTAATTTTTGAGTCAT

**305. *Pasteurella multocida* (SEQ ID NO. 305)**

CTACGCGTGATAACGTCCCACGCCGAGTTCATCTTCTTTACGAGTACGATTAATCACCATTTGTGGCGATTGAAC  
AACGCGAAGTCCCATTTGTTCTTCAGTTCTAACGACTTCACCACGCAGTGAGTTAGTAAACACATCCGTGATCTT  
GATATCAACAACTTCCCAATCATATCAGGCGTGCCACAAAATTGACGATACGATTAGTTTCTGTACGCCCTGT  
GAGTTCCATTAAATCTTTTTTCGAGGGTCCTTCCACTAACACGCGCTGTTCTGTGCCTAACATTGCTCGACTAAA  
TTGCGCGGCTTGATTGTTAATGCGTTGTTGCAACACATATAAACGTTGTTTCTTCTCTTCTGTGCATCATC  
AGGCATATCTGCTGCTGGCGTGCTGGACGTGCTGAATAAATGAAGCTGAACTCATATCAAATTTACTTGTGC  
AATTAAATTCATGGTTTGCTCGAAATCTTCTGCTGTTTCGCCCCGGGAAACCGACAATAAAATCTGAGCTAATTTG  
AATCTCTGGACGCACCGCTCTTAAGTTCCGAATAATCGATTTATATTCTAATGCCGTATGATTGCGTTTCATCAT  
AGATAACACACGATCAGAACCCTTTGTACAGGTAAGTGTAAGAACTCACCAACTCTGGCGTATCACGGTACAC  
ATCAATAATGTCATCAGTGAATCAATTGGGTGACTGGTGGTAAAACGTAAACGGTCAATACCATCAATAGCGGC  
TACTAAACGTAACAATTCGCGAAAAGTACAAATACCGTCATCATGAGTTGCACCACGATAAGCGTTCACGTTTTG  
TCCTAATAAATTCATTCACGCACGCCTTGCTCTGCCAACTGTGCAATTTCAAATAATACATCATCCACTGGACG  
ACTGACTTCTTCACCACGCGTATAAGGCACGACACAGAATGAGCAATATTTATTACAGCCTTCCATAATGGATAC  
GAAAGCAGTTGGACCTTCTGCACGCGGTTCTGGTAAACGGTCAATTTTTCAATTTCTGGAAAAGTACATCGAC  
TACTGAGCTTTTACCACCTCTGATCTGATTGATCATTTTCAGGTAAACGATGTAAGGTTTGTGGTCCAAAAATAAT

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ATCGACATAAGGAGCACGAGTACGAATGTGTTCTCCTTCTTGTGAGGCAACACAGCCCCAACACCGATAACGAG  
TCCCGGCTTATGTTTCTTTAATTCTTTCCAACGTCTAATTGATGGAAAACTTTTCTGTGCTTTTTCACGAAT  
TGAGCAAGTGTTTAACAATAACACATCCGCTTCTTCCGGAATTTCTGTAACTCTAAGCCGTGAGTACTGTTTAA  
GAGATCTGCCATTTTAGATGAATCATATTCATTCATCTGACAACCCACGTTTAAATATGTAATTTTTCGCTCAT

**306. *Haemophilus ducrei* (SEQ ID NO. 306)**

TTACAGATTTACTGCGTATTTGCCTACACCTAAATCATCTTCCTTACGGGTCCGTGCAATGACACTTGATGCTGA  
TTCAACAATACGTAAACCCATTTGATCTTCTGTTCTGATCACTTCACCGCGTAATGAGTTTGAGTAAACATCGGT  
GATTTTAATATCTACGAATTTGCCGATCATATTTGGTGTGCCGATGAAATTAACCTACACGATTGGTTTCTGTACG  
ACCCGTTAATTCATAATATCTTTTTTAGATGGGCCTTCAACCAAATTCGTTGTTCAAGTCCCAAGCATTAAAGCG  
ACTAAATTGCATCGCTTGATGGTTAATTCGTTGTTGTAAGTGTGCTAAGCGGTCTTTTTTCTCATTTTCAGACAC  
ATCATCAGGTAAGTCTGATGCAGGCGTACCTGGACGCGCAGAGTAGATAAAGCTAAAGCTCATATCAAATTTGAC  
TTGTTCAATAATTTTCATTGTTTGTTCAAAGTCTTCCGCTGTTTCGCCAGGAAAGCCAACAATGAAATCTGAGCT  
AATTTGGATATTTGGACGAACCGCACGTAATTTACGAATAATGGCTTTGTATTCTAATGCGGTGTGGTTACGTTT  
CATCATGGTTAAAAACACGATCGGCGCCACTTTGGATAGGTAAATGCAAGAAGCTGACCAATTCTGGAGTATCACG  
ATACACTTCAATAATGTCTCGTGAATTCAATGGGTGGCTTGTGGTATAACGTAAGCGGTCAATACCATCAAT  
GGCGGCAACTAAACGTAATAATTCTGCAAAAGTGCAAAATGCCACCATCAAAGTTTCACCACGGTAAGCATTAAC  
GTTTTGACCCAGCAAGTTAACTTCACGAACGCCTTGCTCTGCTAATTGTGCGATTTTGAATAAGACATCATCAAC  
AGGGCGGGAAACTTCTTCACCACGGGTATAAGGCACTACACAGAATGAGCAGTATTTATTACAGCCTTCCATAAT  
TGATACGAAAGCAGTTGGACCTTCTGCTTTGGGTCTGGTAAGCGGTGCAATTTTTCAATTTCTGGGAAGGAGAT  
ATCGACTACTGCACGATCGCTGATCGGATCTGGTTGATCATTTCTGGTAAGCGGTGCAATGTTTGTGGCCCCAA  
TACTATATCAACAAAAGGGGCACGTTTCACGGATATGTTTCACCTTCTTGTGAAGCAACACAGCCACCAACGCCAAT  
AATTAAATCGGGTTTGTCTTTTTCCAGTTTTTCCAACGACCAAGTTGTGAAAAGACTTTTTCTTGTGCTTTTTTC  
ACGAATTGAGCAAGTATTCAATAATAAAATATCCGCTTCTTCAGGTTTATCGGTTAATTCTAATCCGTGTGTTGA  
GTTTAAGAGATCTGCCATTTTTGATGAGTCATACTCATTCATTTGGCAACCCCAAGTTGTGATATGTAATTTTGC  
CAT

**307. *Vibrio parahaemolyticus* (SEQ ID NO. 307)**

TTATGGCGTAAAGTAGCTACACCTAGCTCATCTTCGCGACGTGTTTTCGCCATCATTTGTGTTGGAGAAATCAC  
ACTACGAAGGTCCATGTCTTTTTCTGTACGTACTAGCTCACCACGTAGCGAGTTTGCAAATACGTCCGTAATCTT  
CACGTCAACGAAGTACCAATTAGGTCTGCGCTACCTTCAAAGTTTACTACACGGTTGTTTTCTGTACGAGCGCG  
CAGTTCCATTAGGTTTTTCTTAGAAGGGCCTTCAACCAGTACACGCTGCTCAGTAGCAAGCATTAGGCGTGAGTA  
ACGCATTGCTTGTGCATTGATGGTTTGTGTCAGCTCGTATAGACGCTCTTCTTCACTTGCTCTGGTATATCACA  
AGGGTAATCTGCCGACGGTGTACCTGGACGAGGTGAGAAGATAAAGCTGAAGCTCATGTCAAAGTCTACGTCTTT  
GATTAGCTTCATTGTGTCTTGAAGTCTTTGTCTGTTTACCAGGGAAACCAACAATAAAGTCAGAACTGATTTG  
GATATCAGGACGCGCTTTACGTAGTTTACGGATGATCGACTTGTACTCGATAGCTGTGTGAGGACGCTTCATCAT  
CGTTAGAATACGGTCACTACCACTTTGTACTGGCAGGTGTAGGAACTCACAAGCTCCGGGGTATCTTCGTAAAC  
CGCGATGATGTCTGTAACTCTAGCGGGTGGCTAGTCGTGAAACGAATACGGTCGATACCATCGATAGATGC  
AACGAGACGAAGCAGTTTCAGCAAAAGAGCAGATCTCGCCGTCGTGCATAGGGCCACGGTATGCGTTTACGTTTTG  
ACCTAGTAGGTTAACTTCACGTACACCTTGTTCCGCTAGCTGTGCAATCTCGAATAACACGTATCCATTGGACG

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ACTAACTTCTTCACCACGAGTGTATGGTACAACGCAGTAAGTGCAGTATTTTGAACAGCCTTCCATGATAGAAAC  
AAACGCCGTCGCACCTTCTGCACGTGGCTCAGGTAGGCGGTGGAACCTTTCAATCTCTGGGAACGAAATGTCCAT  
TACCGGTGCATCGTCAGTTTGAGATTGTTTGATCATCTCAGGTAGGCGGTGCAGAGTTTGAGGGCCAAAGATCAC  
GTCAACGTATGGTGCACGCTCACGGATGTGGTCACCTTCTTGTGTTGCTACACAACCACCTACACCGATAACTAC  
GCCAGGTTTTTTATCTTTTAGTGTTTTCCAACGGCCTAGCTGGTGGAAAACCTTCTCTTGCAGCTTTTTTCACGGAT  
CGAACAGGTGTTAAGTAGAAGTACGTCTGCTTCCTCTGGCTCTTCCGTCAGCTCATAGCCGTTTGACAGCATTAAG  
CAGGTCGGCCATTTTTGATGAATCGTATTCGTTTCATCTGGCAGCCCCAGGTTTTAATTAGCAGTTTCTTACTCAT

**308. *Yersinia pestis* (SEQ ID NO. 308)**

GAATTTACCAATCATGTGCGGTGAACCCCTCAAAGTTACAGACGCGGTTGTTTTCCGTACGCCCCGCCAGTTCCAT  
GACATTTTTGCGAGAGGTACCCTCCACCAAACACGCTGTACTGTCCCTACCATCTTACGGCTAATTTCCATCGC  
CTGTTGGCTAATGCGTTGTTGCAGGATATGTAGCCGCTGTTTTTCTCTCTTTCGGACACATTGTTGGGTAAATC  
AGCCGCTGGTGTGCCGGGACGCGGGGAGTAAATAAAGCTGTAGCTGGTATCAAAATGAATATCTGCGACCAGTTT  
CATGGTCTGTTCAAAATCCTGCTGGGTTTTACCAGGGAAGCCGACAATAAAATCAGAACTTATCTGGATATCAGG  
GCGTGCTTGACGCAGTTTGCGGATGATGGCTTTGTATTCCAAGGCGGTATGGGCACGCTTCATCATGGTCAAAAT  
ACGGTCAGAACCGCTTTGTACCGGCAAATGCAGGAAGCTCACCAATTCAGGCGTATCGCGATAAACATCAATGAT  
ATCGTCAGTAACTCAATGGGGTGGCTGGTGGTAAATCGTACCCTATCGATACCATCAATCGCCGCAACCAAACG  
CAACAGCTCGGCAAACTACAGATATCGCCATCGTAGGTTGCCCCGCGGTAGGCGTTAACATTCTGGCCGAGTAA  
GTTGACTTCACGTACGCCTTGAGCGGCTAACTGGGCGATTTCAAAAAGAATGTCATCGCTTGACGGCTGACTTC  
CTCGCCTCGGGTGTAGGGTACGACACAGAATGTACAATATTTATTGCAGCCTTCCATGATCGAAACAAACGCAGT  
TGGGCCTTCAGCCCGTGGTTCTGGCAAACGGTCAAATTTTTCAATTTCCGGAAAACCTGATATCCACGACAGGGCT  
ATTCGTTCCCTTGACGTGGTTAATCATTTCCGGTAAACGATGCAGCGTTTGTGGCCCCGAAGATGACATCGACACA  
GGGGGCGCGCTGGCGCAATTGTTACCTTCCTGTGACGCCACGCAACCACCGACCCCAATAATCAACTGCGGGTT  
TTTCTCTTTCAATAATTTCCATTGCCCTAGCAGGCTGAATACTTTTTCTGTGCTTTTTCCCGGATAGAACAGGT  
ATTTAGCAGCAGTAAATCCGCTTCTTCCGGGATGGTGGTTAACTGGTAGCCATGGGTACTGGCCAAGAGATCTGC  
CATTTTAGATGAATCGTATTCATTCATCTGGCAACCCAGGTTTTGATATGCAGTTTTTTAGTCATCGGGTTAT  
CATCATCAAAATCACCTCGTTCCGTGCGGTACTCCGTTGTGGTAGATAATCTCCGTTGTAGTAGAGAGTCGCAAA  
GGCTTCGTCGTTAGGGAGCATTGTAGTCATTTGCCTCTGCGATGACCACCGCAGAACCGTTGAGTTATTCTGTTG  
AGTGATAAAAAATCCGTTACACTGCGGTTAGACAAAACCTTGCTAATG

**309. *Vibrio cholerae* (SEQ ID NO. 309)**

TCTTCACTTCTTCCGACAGATCGCAAGGATAGTCAGCGGCGGGTGTGCCTGGACGAGGTGAGAAAATAAAGCTAA  
AGCTCATGTGAAATCGACATCGCGGATCAGCTTCATGGTGTCTTGAAATCTTTGTGCGTTTCCCCTGGGAAGC  
CAACGATAAAATCAGAGCTGATTTGAATATCTGGGCGTGCTTTACGTAGCTTACGGATGATGGATTTGTACTCAA  
TCGCCGTATGTGGACGCTTCATCATAGTCAGAATGCGATCGCTCCCACTTTGTACTGGCAAGTGCAGGAAGCTCA  
CCAGCTCAGGCGTGTCTTCGTACACTGCAATAATGTCATCGGTAAATTCGAGTGGGTGGCTAGTGGTAAAGCGGA  
TACGATCGATGCCGTCAATGGTGGCGACCAAACGCAGTAATTCAGCGAAAGAGCAAATGCCGCCATCGTGAGTGG  
CACCACGGTAAGCGTTGACGTTTTGACCCAGCAGGTTAACTTCACGCACCCCTTGCTCGGCAAGCTGAGCGATCT  
CGAACAGGACATCGTCCATAGGACGGCTGACTTCTTCACCGCGTGTGTAAGGCACTACGCAGTAAGTACAGTATT  
TTGAGCAGCCTTCCATGATAGAAACGAACGCCGTTGGGCCTTCCGCACGTGGCTCAGGCAGGCGGTGCAATTTTT

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CAATCTCAGGGAAAGAGATATCCATCACGGGCGCGTCGCTGGTTTGCATTGTTTAATCATTTCTGGCAGACGAT  
GCAGCGTCTGTGGGCCGAAGATGACATCCACATAAGGCGCACGATCGCGAATCGAGTCACCTTCTTGAGTAGCAA  
CACAGCCACCGACACCGATCACGACACCTGGCTTCTTGTCTTTCAGGGTTTTCCAACGACCGAGTTGGTGGAAGA  
CTTTTTCTGCGCTTTTTCACGAATCGAACAGGTGTTTAGGAGTAAACGTCAGCTTCTCGGGTATTTCTGTCA  
GCTCATAGCCGTTTGCAGCATTAAGCAGGTCAGCCATTTTCGATGAATCGTACTCGTTCATCTGGCAGCCCCAAG  
TTTTAATTAGCAGTTTCTTACTCATCTCACTTTCGCTCGTTCAATAGTTCTTCAATCATTTGAGCTGTAGCTCAC  
ATTCTAGCCGCCCTCTCGGCGGTAAGCGGCGTATTGTACTGCTTTAAAAACCGACTGACTAGTAATTGGCGGAAT  
TCTCTTGTAACCCCTTG

**310. *Escherichia coli* souche K12 (SEQ ID NO. 310)**

TTACGGCTGATAATAACCCACGCCAAGGTCGTTTTCTTTGCGGGTACGGGCAATCACTGATTCGGGTGTTTCTGC  
CACGCGCAGACCCATTTTCATCTTCAGTACGCACCACTTTACCGCGCAGAGAGTTCCGGGTAGACGTCGGTAATTC  
TACATCGACGAATTTACCGATCATATCCGGCGTGCTTTCGAAGTTGACCACGCGGTTATTTTCCGTACGCCCGGA  
AAGCTCCATGATGCTCTTACGCGATGTACCTTCTACCAGAATACGCTGGGTGGTGCCGAGCATCCGGCGGCTCCA  
CGCCATCGCTTGCTGATTAATGCGCTCTTGCAGAATATACAGACGCTGCTTCTTCTCTTCTTCCGGAACATCATC  
AACCATATCGGCGGCTGGTGTACCCGGACGTGCAGAGAAGATAAAGCTGTAGCTCATGTGCGAAATTGACGTCGGC  
AATCAGCTTCATCGTTTTTCTCGAAGTCTTCGGTGGTTTCGCCAGGGAAGCCACGATGAAATCAGAACTGATCTG  
AATATCTGGACGCGCCGCACGCAGTTTACGGATGATCGCTTTGTACTCCAGCGCCGTATGGGTACGGCCCATCAG  
GTTCAGAATGCGATCGGAACCGCTCTGTACCCGGCAGATGCAGGAAGCTCACCAGCTCCGGCGTGTGCGGATACAC  
TTTCATGATACGTCGGTGAATTCGATCGGATGGCTGGTGGTAAAGCGAATACGATCGATCCCGTCGATCGCAGCA  
ACCAGACGCAGCAGATCGGCAAACGATCCGGTGGTGCCGTCGTAGTTTTTACCACGCCAGGCGTTCACGTTCTGA  
CCGAGCAGGTTGACTTCACGCACGCCCTGAGCCGCAAGCTGGGCAATCTCAAACAGAATATCGTCGGACGGACGG  
CTTACCTCTTACCACGGGTGTAAGGCACCACGCAGTAGGTGCAATATTTATTGACGCCCTTCATGATGGAGACA  
AACGCGGTGCGCCCTTCGGCGCGCGGTTCCGGTAGACGGTCAAACCTCTCGATTTCCGGGAAGCTGATATCTACA  
ACCGGGCTGCGGTGCGCCACGCACGGAGTTGATCATCTCCGGCAGACGGTGCAGCGTTTGCGGCCCCAAAAATAATA  
TCGACATAGTGGGCGCGCTGGCGAATGTGCTCGCTTCTTGCGATGCCACGCAGCCACCGACGCCGATAATCAGG  
TCTGGATTCTTCTCTTTTAACAGTTTCCAGCGACCCAACTGATGGAAGACTTTTTCCTGAGCCTTCTCGCGGATT  
GAGCAGGTGTTTCAGCAGCAGCACATCCGCTTCTTCCGCCACGTCGGTCAGTTGATAGCCGTGGGTGGCATCCAGC  
AGATCGGCCATCTTCGATGAATCGTACTCGTTCATCTGACAGCCCCAGGTTTTAATATGGAGTTTTTTGGTTCAT

**311. *Escherichia coli* souche 0157:H7 (SEQ ID NO. 311)**

TTACGGCTGATAATAACCCACGCCAAGGTCGTTTTCTTTGCGAGTACGGGCAATCACCGATTCTGGTGTTTCTGC  
CACGCGCAGACCCATTTTCATCTTCAGTACGCACCACTTTACCGCGCAGAGAGTTCCGGGTAGACGTCGGTAATTC  
TACATCGACGAATTTACCGATCATATCCGGCGTGCTTTCGAAGTTGACCACGCGGTTATTTTCCGTACGCCCGGA  
AAGCTCCATGATGCTCTTACGCGATGTACCTTCTACCAGAATACGCTGGGTGGTGCCGAGCATCCGGCGGTYCCA  
CGCCATCGCTTGCTGATTGATACGTTCTTGCAGAATATACAGACGCTGCTTCTTCTCTTCTTCCGGAACATCATC  
AACCATATCGGCGGCTGGTGTACCCGGACGTGCAGAGAAGATAAAGCTGTAGCTCATGTGCGAAATTGACGTCGGC  
AATCAGCTTCATCGTTTTTCTCGAAGTCTTCGGTGGTTTCGCCAGGGAAGCCGACGATGAAGTCAGAACTGATCTG  
AATATCTGGACGCGCCGCACGCAGTTTACGGATGATCGCTTTGTACTCCAGCGCCGTATGGGTACGTCCCATCAG  
GTTCAGAATGCGATCGGAACCGCTCTGTACCCGGCAGATGCAGGAAGCTCACCAGCTCCGGCGTGTGCGGATACAC

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TTTCGATGATATCGTCGGTGAATTCGATCGGATGGCTGGTGGTAAAGCGAATACGATCGATCCCGTCGATCGCAGC  
AACCAGACGCAACAGATCGGCAAACGATCCGGTGGTGCCGTCGTAGTTTTTACCACGCCAGGCGTTCACGTTCTG  
ACCGAGCAGGTTGACTTCACGCACGCCCTGAGCCGCAAGCTGGGCAATCTCAAACAGAATATCGTCAGACGGACG  
GCTTACCTCTTACCACGGGTGTAAGGCACCACGCAGTAGGTGCAATATTTATTGCAGCCTTCCATGATGGAGAC  
AAACGCGGTGCGCCCTTCGGCGCGCGGTTCGGGTAGACGGTCAAACCTCTCGATTTCCGGGAAGCTGATATCTAC  
AACCGGGCTGCGGTGCGCCGCGCACGGAGTTGATCATCTCCGGCAGACGGTGCAGCGTTTGCGGCCCAAAAATAAT  
ATCGACATAGTGGGCGCGCTGGCGAATGTGCTCGCCTTCTTGCGATGCCACGCAGCCACCGACGCCGATAATCAG  
GTCTGGATTCTTCTCTTTTAACAGTTTCCAGCGACCCAAGTATGGAAGACTTTTTCTGAGCCTTCTCGCGGAT  
TGAGCAGGTGTTTACGACGAGCACATCCGCTTCTTCCGCCACGTCGGTCAGTTGATAGCCGTGGGTGGCATCCAG  
CAGATCGGCCATCTTCGATGAATCGTACTCGTTCATCTGACAGCCCCAGGTTTTTAATATGGAGTTTTTTGGTCAT

**312. *Pseudomonas aeruginosa* (SEQ ID NO. 312)**

CCGCCGTACGGTCGTGCGCCTCAATGCAGGGTGCTGTCGATCAGGGTACCGCGCAGCGAGTGCGGCAGCGCGTCG  
TCGATGTGCACCTGGGCGAACTGGCCGATCAGGCGTGGATTGTGCGCAGCGGAAGTTGACGATCCGGTTGTTCTCG  
GTGCGCCCCCTGGAGCATGCCTGGGTCTTCTTCGAGAAGTCGGTGACCAGGATCCGCTGGGTGCTGCCGACCATG  
CGCCGGCTGATCTCGTAGCCTTGCTGGTGGATGCGGCTCTGGAGGATCTGCAGGCGCTGTTTCTTCACTTCTTCC  
GGCAGGTGCTCGGCGAGGTGCGGCGCGGGCGTGCCGGGCGCGCGCTGTAGATGAAGGAGAAGGAGAAGTCGAAG  
CCGACGTCCTCCACCAGCTTCATGGTCTGCTCGAAGTCCTTCTCGGTTTCGCCGGGGAACCGACGATGAAGTCG  
GAGCTGATGCAGATGTCCGGTACCGCGGCCTTCAGCTTGCGGATACGCGACTTGTATTCCAGCACGGTATGGTTG  
CGCTTCATCGCCGCCAGCACGCGGTGCGAGCCCGACTGCACCGGCAGGTGGATGAATTTACCAGCTCCGGCACC  
TCGGCGTGGGCTGGATCAGCGCGTGGGAGAATTCAGCGGGTGCGAGGTGGTATAGCGGATGCGCTCGATACCG  
TCGACGGCGGCGACCAACCGCAGAGTTCGGCGAAGTCGGCCAGGCGGCCATCGTGGGTGAGGCCGCGGAAGCCG  
TTGACGTTCTGTCCAGCAGGGTGACTTCGCGGACGCCGTTCTCGGCCAGGTGGATCACTTCGGCGATCACGTCG  
TCGAATGGTGGGCTGACTTCCTCGCCGCGGGTGTAAGGACACGCAGAAGCTGCAGTACTTGCTGCAGCCTTCC  
ATCACCGAGACGAAGGCGGTGGGGCCATCGACCCGCGGTTCCGGCAGGCGGTGCAATTTCTCGATTTCCGGGAAG  
GACACGTCGACCTGCGGCTTGCGCGTGCTGCGCGCGGCGTCGATCATTTCCGGCAGGCGGTGCAGGGTCTGCGGG  
CCGAAGACCACGTCGACATAGGGCGCGCGCTCACGGATCGCGGCGCCTTCCTGGCTGGCCACGCAGCCGCCGACG  
CCGATCACAGGTGCGGATTCTGCTGCTTCAGCTCGCGCCACATGCCGAGCTTGAAAACACCTTTTCTGGGGC  
TTCTCGCGGATCGAGCAGGTATTGAGCAGGATGACGTCGGCCTCGGCGGCGTTTTTCGGTCACCTCGAGGGCTTGG  
TGTTACCGAGCAGGTCCGCCATTCGCGACGAGTCGTAAGTTCGTTTCTGTCAGCCGTGGGTTCGATGAAAAGC  
TTCTTGCCCATGCGCTTCGTCGGACAGTTGAAAAGGACCGCGCATTATAGAGGGCGGGGCCCCCGGTTCTTAGC  
GTTGCTGGCCGAAAGGCTGTGCTATGATTGCGGCCCTTCATTTTCCGGCATTGCTTTCCCCGCCATGAACAAGCG  
CGAAAACCCCATCTACAAGGTGATTTTCTCAACCAGGGCCAGGTCTTCGAGATGTATGC

**313. *Bordetella pertussis* (SEQ ID NO. 313)**

TCATTCGGCTCCGGATGTGTCGCGTTCGATGCCGGCGACACGGCCGCGCAGCGAGTTGGTGTGGGCGTGGGTGAC  
GACGACGTCGACCATGTGGCCGATCAGGCGCGGCACGCCGGGAAAGTTGACGATACGGTTGTTCTCGGTACGGCC  
CATCAGCTCGTTGGGGTCGCGCCGCGAAGGGCCTTCGACCAGCACGCGCTGGCGGGTGCCGATCATGCCCTGGGC  
GATGGCCGCGGCTGCTGGTTGATGAGCGCCTGCAACTGCTGCAGGCGGCGCAGCTTGACGTCCTGCGGCGTGTC  
ATCGTGCAGGTGCGGCGCCGGCGTGCCGGGCGGCGCGAATACACGAACGAGAACGAGGTGTCGAAGCCGACGTC

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CTCGATCAGCTTCATGGTCTTCTGGAAGTCCTCCTCGGTCTCGCCCGGGAAACCAACGATGAAGTCCGAGGACAG  
CGTCAGGCTGGGGCGCGCAGCGCGCAGGCGGCGCACCACGGAATTGAACTCCAGCGCGGTGTAGCCGCGCTTCAT  
GGCCGCCAGCACCCGGTCGCTGCCGGCCTGCACCGGCAGGTGCAGGAACGACACCAGCTTGGGCAGCCGTGCGTA  
GGCGTCGACCATGCGCTGGGTCAATTCCTTCGGATGCGAGGTGGTGTAGCGGATCCGTTGATACCGGGAATCTC  
GTGCACGTATTCAGCAGCATGGCGAAATCGGCGATTTGCGCGCTGTGCGCCATGGCGCCGCGGTAGGCGTTGAC  
GTTCTGGCCCAGCAGCGTGAATTCCTTGACGCCCTGGTCGGCCAGGTGCGCGACCTCGAGCAGGACGTGTCGTA  
GGGGCGCGACACTTCTTCGCCGCGCGTGTAGGGCACCACGCAGAAGCTGCAATACTTGCTGCAGCCTTCCATGAT  
GGACACGAACGCGGTGGCGCCGTGACGCGCGGCGGGGCGAGGGCGTCAACTTCTCGATCTCGGGGAAGCTGAT  
GTCGACCTGCGACACGCCCTGGGCGCGGCGGCGCTTGATCAGGTGCGGCAGCCGGTGCAGGGTCTGCGGGCCGAA  
CACCACGTGACATAGGGCGCGCGCTTGACGATGGCCTCGCCTTCCTGGCTGGCCACGCAGCCGCCACGCCGAT  
CACCAGGTTGGGGTTCTGCTTCTTGAGGTGCTGTACCCGGCCCAGGTGCGAGAACACCTTCTCCTGCGCCTTCTC  
GCGCACGGAACAGGTGTTGAACAGGATGACATCGGCATCCTCGGGGTTGTGCGTCACTCCAGGCCCTGGTCGGC  
GCGCAGCACGTGCGCCATCTTGTCCGAGTCGTACTCGTTTCATCTGGCAGCCGAAGGTGCGGATATACAA

**314. *Bordetella parapertussis* (SEQ ID NO. 314)**

TCATTCGGCTCCGGATGTGTGCGTTTCGATGCCGGCGACACGGCCGCGCAGCGAGTTGGTGTGGGCGTGGGTGAC  
GACGACGTGACCATGTGGCCGATCAGGCGCGGCACGCCGGGAAAGTTGACGATACGTTGTTCTCGGTACGGCC  
CATCAGCTCGTTGGGGTCGCGCCGCGAAGGGCCTTCGACCAGCACGCGCTGGCGGGTGCCGATCATGCCCTGGGC  
GATGGCCGCGGCCTGCTGGTTGATGAGCGCCTGCAACTGCTGCAGGCGGCGCAGCTTGACGTCCTGCGGCGTGT  
ATCGTGCAGGTGCGCGGCGGCGTGC CGGGCGGCGGAATACGAACGAGAACGAGGTGTGAAGCCGACGTC  
CTCGATCAGCTTCATGGTCTTCTGGAAGTCCTCCTCGGTCTCGCCCGGGAAACCGACGATGAAGTCCGAGGACAG  
CGTCAGGCTGGGGCGCGCAGCGCGCAGGCGGCGCACCACGGAATTGAACTCCAGCGCGGTGTAGCCGCGCTTCAT  
GGCCGCCAGCACCCGGTCGCTGCCGGCCTGCACCGGCAGGTGCAGGAACGACACCAGCTTGGGCAGCCGTGCGTA  
GGCGTCGACCATGCGCTGGGTCAATTCCTTCGGATGCGAGGTGCTGTAGCGGATCCGTTGATACCGGGAATCTC  
GTGCACGTATTCAGCAGCATGGCGAAATCGGCGATTTGCGCGCTGTGCGCCATGGCGCCGCGGTAGGCGTTGAC  
GTTCTGGCCCAGCAGCGTGAATTCCTTGACGCCCTGGTCGGCCAGGTGCGCGATCTCGAGCAGGACGTGTCGTA  
GGGCCGCGACACTTCTTCGCCGCGCGTGTAGGGCACCACGCAGAAGCTGCAATACTTGCTGCAGCCTTCCATGAT  
GGACACGAACGCGGTGGCGCCGTGACGCGCGGCGGGGCGAGGGCGTCAACTTCTCGATCTCGGGAAAGCTGAT  
GTCGACCTGGGACACGCCCTGGGCGCGGCGGCGCTTGATCAGGTGCGGCAGCCGGTGCAGGGTCTGCGGGCCGAA  
CACCACGTGACATAGGGCGCGCGCTTGACGATGGCCTCGCCCTCCTGGCTGGCCACGCAGCCGCCACGCCGAT  
CACCAGGTTGGGGTTCTGCTTCTTGAGGTGCTGTACCCGGCCCAGGTGCGAGAACACCTTCTCCTGCGCCTTCTC  
GCGCACGGAACAGGTGTTGAACAGGATGACATCGGCATCCTCGGGGTTGTGCGTCACTCCAGGCCCTGGTCGGC  
GCGCAGCACGTGCGCCATCTTGTCCGAGTCGTACTCGTTTCATCTGGCAGCCGAAGGTGCGGATATACAATTTGCC  
CAGGCCCTGGGCGGTGGTGGCCGCGGTGCCGGCATCGGACGGGCTGGCGCCGTGCGGTTTGACAGTGGTTTTCTTG  
CAT

**315. *Burkholderia pseudomallei* (SEQ ID NO. 315)**

TCAGTGCCTGGCGGCGCTCGCGTCGCCGTGCGCGAGCACGAGCTCGCCGCGCAGCGAGTGGGGATACGCGTGATT  
GATCTTCACGTGATCATCTGGCCGATCAGGCGCGGGTGC CGGCGCTCGGCGCGGGAAAATTCACGACCCGGTT  
GTTCTCGGTGCGGCGCGGAGCTCGTTTCGGATCCTTGCGCGACGGCCCTCGACGAGGATTCGCTCGACCTTGCC

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GAGCATCGACTGGCTGATCCTCGCGACGTTCTCCTCGATCGTCGCCTGCAGATGTTGCAGGCGCTTGAGCTTGAG  
CTCGCGCGGCGTGTCTGTCGGCGAGATTCGCGGCCGGCGTGCCGGGCGCGGGCTGTAGATGAACGAGAAGCTCGT  
GTCGTAGCTCATCTCGTGAACGAGCGCCATCGTCTTGTCGAAGTCGGCGTCGGTCTCGCCGGGGAAACCCACGAT  
GATGTCCGTGGACAGCGACAGATTCGGGCGGATCGCGCGCAGCTTGCGGATCACCGATTTGTATTTCGAGCACGGT  
GTAGCCGCGCTTCATCGCCATCAGGATGCGGTCCGAGCCGTGCTGGACGGGCAGGTGCAGATGGTCGACGAGCTT  
CGGCACCTTCGCGTAGACGTGAGCAGGCGCTGCGTGAACCTCTTCGGATGCGATGTCGTGTAGCGGATCCGCTC  
GATGCCGGGGATGTCGGCGACATATTCGATCAGCGTCGCGAAATCGGCGATCTCGGCCGAGCCGGCCGCGATCGC  
GCCGCGGTAGGCGTTACGTTCTGGCCGAGCAGCGTGAATTCGCGCACGCCCTGGTCGGCGAGGCCCGCGACCTC  
GGTCAAGACGTCGTGAGCGGGCGCGACACTTCATCGCCGCGCGTGTACGGCACGACGCAGTAGCTGCAGTACTT  
CGAGCAGCCTTCCATGATCGACACGAACGCGCTCGGCCCTTCGACGCGAGCGGGCGGCAGATGGTCGAACCTTCTC  
GATTTCTGGGGAACGTGATGTCGACCTGCGCGCGGCCGCTTTTCGCGGCGCGCGTCGATCATCTGCGGCAGGCGGTG  
CAGCGTTTTCGGGGCCGAACACGAGATCGACGTACGGCGCGCGCGACGATCGACGCGCCTTCTGGCTCGCCAC  
GCAGCCGCCGACGCCGATCAGCAGGTCCGGCTTCGCTTCTTCAGCTCGCGCACGCGGCCGAGATCGGAGAACAC  
CTTCTCCTGCGCCTTTTCTCGCACCGAGCAGGTGTTGAACAGGATGATGTCCGCGTCTTCGGGGTGTGCGTTTT  
CTCGAGGCCCTCGGCCGCATTGAGCACGTGACCATCTTGTGCGAGTCGTACTCGTTCATCTGGCAGCCGAAGGT  
TTTTACGTAAACTTTCTTGGTCAT

**316. *Vibrio vulnificus* (SEQ ID NO. 316)**

TTATGGCGTAAATGTCGCTACACCTAGCTCATCTTCGCGGCGTGTTTTGGCCATCATTTGTGTTGGCGAAATCAC  
GCTACGTAGGTCCATATCTTTTTCAGTACGTACAATCTCACCACGCAGTGAGTTCGCAAATACATCGGTAATTTT  
CACATCAACGAAGTACCAATCAGATCTGCGCTACCTTCAAAGTTTACTACACGGTTGTTTTCTGTACGAGCACG  
TAGCTCCATCAAGTTCTTCTTAGAAGGGCCTTCAACCAGTACACGCTGCTCTGTGCCTAGCATGAGGCGAGAGTA  
ACGCATGGCTTGTGCGTTGATTTGTTGTTGCAGTTCGTACAAGCGCTCTTTCTTCGTCTCTTCTGAAAGATCACA  
TGGGTAATCTGCCGAGGAGTACCAGGGCGAGGAGAGAAGATGAAGCTGAAGCTCATGTCAAAGTCGACATCTTT  
GATCAGCTTCATGGTGTCTTGAAATCTTTGTCGCTTTCACCTGGGAAGCCAACAATAAAGTCAGAACTGATTTG  
GATATCAGGACGCGCTTTACGCAGTTTACGAATGATCGACTTGATTCGATGCCAGTGTGAGGACGCTTCATCAT  
CGTCAGAATGCGATCGCTACCACTTTGTACTGGTAGATGAAGGAAGCTCACCAGCTCTGGCGTATCTTCGTAGAC  
AGCGATGATATCATCGGTGAACTCAAGTGGGTGGCTGGTGGTAAAGCGAATACGGTCGATACCATCGATAGACGC  
AACAAGGCGAAGCAGTTCTGCAAAAGAACAGATTTACCATCGTGCGTTGGGCCACGGTATGCGTTTACGTTTTG  
GCCTAGCAGTTGACTTCGCGAACACCTTGCTCGGCAAGTTGCGCGATTTTCGTAAAGCACATCGTCCATTGGGCG  
GCTGACTTCTTACCACGAGTGTAAGGCACTACGCAGTAAGTACAGTACTTAGAACAGCCTTCCATGATAGAAAC  
GAATGCGGTTGCGCCTTCTGCACGTGGTTCTGGCAGACTGTCAAACCTTCTCGATTTCTGGGAATGAAATGTCCAT  
CACTGGTGCATCTTCACTTTGTGATTGTTTGATCATTTTCAGGAAGACGGTGCAAGGTTTTCGGGCCAAAGATAAC  
GTCAACAAAAGGTGCAGTTTACGAATGTGATCGCCTTCTGTGTTGCTACACAACCACCAACACCGATCACGAC  
GCCTGGCTTTTTATCTTTGAGTGTTTTCCAACGGCCAAGCTGGTGGAACACTTTTTCTTGCGCCTTTTTCAGGAT  
CGAACAGGTGTTAAGTAATAGAATCTGCTTCTTCTGGTTCTTCTGTCAATTTCGTAGCCATTTGCTGCGTTTCAG  
CAGATCCGCCATTTTCGATGAATCGTATTCGTTTCATCTGGCAACCCCAGGTTTTAATTAGCAGTTTCTTACTCAT



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**317. *Vibrio fischeri* (SEQ ID NO. 317)**

CTATGGCGTAAAAGTACCTACACCAAGATCATCTTCACGACGTGTCTTTTCCATCATTTCTGCTGGAGTCATAAC  
AACACGTAAACCCATGTCTTTTTCTGTACGAAGTAGTTACACACGCAGTGAGTTCGCAAATACATCTGTGATTTT  
AACATCAACAAATTGACCAATAAGATCCGCTGAACCTTCAAAGTTTACAACACGGTTGTTTTCTAGTACGAGCAGC  
AAGTTCCATCAGGTTTTTCTTCGATGGGCCTTCAACTAATACACGTTGCTCAGTGTCTAGCATTAGACGAGAGTA  
GCGCATTGCTTGGCTGTTTACTTGCTGTTGCAGTTCAGCTAGGCGATCTTTCTTCTCTTGTTTCAGGGATATCACA  
TGGATAATCAGCAGCAGGTGTTCTTGGACGCGCAGAGAAGATGAAACTAAAGCTCATGTGGAAGTCGACATCTTT  
AATCAGTTTTCATTTGTATCTTGGAAAGTCTTTGCGCGTTTCACCAGGGAAGCCAACAATAAAGTCAGAACTGATTTG  
AATATCAGGACGAGCCTTACGTAATTTACGAATGATTGATTTGTATTCAATCGCTGTGTGAGGGCGCTTCATCAT  
AGTTAGAATACGATCAGAACCCTTTGAACAGGTAAGTGTAAGAACTTACTAGCTCTGGCGTATCTTCGTATAC  
AGCGATGATGTCATCACCAACTCTAATGGGTGGCTTGTTGTAAAGCGTAAACGGTCGATACCATCGATAGATGC  
AACCATACGTAATAATTCAGCAAATGTGCAGATATCACCGTCGTGCATTGGACCACGGTACGCGTTAACGTTTTG  
ACCCAATAGGTTTTACTTCACGTACGCCTTGCTCTGCAAGCTGTGCAATTTCAAATAATACGTCATCAAGAGGACG  
GCTTACTTCTTCACCACGAGTGTATGGAACAACACAGTAAGTACAGTACTTAGAACACCCTTCCATAATAGAAAC  
GAACGCTGTTGCACCTTCTGCTTTTGGTTTCAGGAAGGTTATCGAACTTTTCGATCTCTGGGAATGAAATATCCAT  
TACTGGTTTTTTCATTTGATTGAGATTGGCGGATCATTTTCAGGTAAACGGTGTAAGTTTGTGGACCAAAAATTAC  
GTCAACGTATGGAGCTCGTTGGCGAATATGATCACCTTCTTGAGTTGCAACACAACCACCAACACCGATCACTAG  
ATCTGGTTTTTTATCTTTTAGGTTTTTCCAGCGGCCTAATTGGTGAAACACTTTCTCTTGCTTTTTTCACGAAT  
AGAGCAGGTATTTAATAGTAGAACGTCAGCTTCTGTTGGTTCTTCTGTTAATTCATAACCATTTGCGGCACCTAA  
AAGGTCGGCCATTTTAGATGAATCGTATTCGTTTCATCTGACAGCCCCAGGTTTTGATCAGCAGTTTCTTAGTCAT

**318. *Yersinia pseudotuberculosis* (SEQ ID NO. 318)**

TTAAGGCTGATAAATACCTACACCAATTTCAATTTCTTTACGGGTGCGAGCAATCACCGATTGCGGTGACTCGTG  
GGTTCGCAGGTCCATCTGATCTTCTGTACGCAGTAAAATGCCGCGCAGTGAAGTGGCATAAACGTTAACAATTTT  
GACATCAACGAATTTACCAATCATGTGGGTGAACCTCAAAGTTACGACGCGGTTGTTTTCCGTACGCCGGC  
CAGTTCCATGACATTTTTGCGAGAGGTCCCCTCCACCAAAACACGCTGTACTGTCCCTACCATCTTACGGCTAAT  
TTCCATCGCCTGTTGGCTAATGCGTTGTTGCAGGATATGTAGCCGCTGTTTTTTCTCCTCTTCGGACACATTGTC  
GGGTAAATCAGCCGCTGGTGTGCCGGGACGCGGGGAGTAAATAAAGCTGTAGCTGGTATCAAATGAATATCTGC  
GACCAGTTTCATGGTCTGTTCAAAATCCTGCTGGGTTTCACCAGGGAAGCCGACAATAAAATCAGAACTTATCTG  
GATATCAGGGCGCGCCTGACGCAGTTTGGCGATGATGGCTTTGTATTCCAGGGCGGTATGGGCACGCTTCATCAT  
GGTCAAAATACGGTCAGAACCCTTTGTACCGGCAAATGCAGGAAGCTCACCAATTCAGGCGTATCGCGATAAAC  
ATCAATGATATCGTCAGTAACTCAATGGGGTGGCTGGTGGTAAATCGTATCCTATCGATACCATCAATGGCCGC  
AACCAAACGCAACAGCTCGGCAAAACCTACAGATATCGCCATCGTAGGTTGCCCCGCGGTAGGCGTTAACATTCTG  
GCCGAGTAAGTTGACTTCACGTACGCCTTGAGCGGCTAACTGGGCGATTTCAAAAAGAATGTCATCGCTTGACG  
GCTGACTTCCTCGCCTCGGGTGTAGGGTACGACACAGAATGTACAATATTTATTGCAGCCTTCCATGATCGAAAC  
AAACGCAGTTGGGCCTTCAGCCCGTGGTTCTGGCAAACGGTCAAATTTTTCAATTTCCGGGAAAACCTGATATCCAC  
GACAGGGCTATTCGTTTCCTTGACGTGGTTAATCATTTCCGGTAAACGATGCAGCGTTTGTGGCCCGAAGATGAC  
ATCGACACAGGGGGCGCGCTGGCGCAATTGTTACCTTCTGTGACGCCACGCAACCACCGACCCCAATAATCAA  
CTGCGGGTTTTTCTCTTTCAATAATTTCCATTGCCCTAGCAGGCTGAATACTTTTTCTGTGCTTTTTCCCGGAT

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AGAACAGGTATTTAGCAGCAGTAAATCCGCTTCTTCCGGGATGGTGGTTAACTGGTAGCCATGGGTACTGGCCAA  
GAGATCTGCCATTTTAGATGAATCGTATTCATTCATCTGGCAACCCAGGTTTTGATATGCAGTTTTTTAGTCAT

**319. *Salmonella enterica subspecies paratyphi A***

**(SEQ ID NO. 319)**

TTAAGGCTGGTAGAATCCTACGCCCAGCTCATTTTCTTTACGGGTACGGGCAATGACGGACTCCGGCGTTTCGGC  
GACGCGCAGCCCCATTTTCATCTTCGGTACGCACCACCTTTCCGCGCAGGGAGTTTCGGATAGACGTCAGTAATTTTC  
CACATCGACAAACTTACCAATCATCTCCGGCGTGCCTTCAAAGTTCACCACCCGATTGTTTTTCGGTACGGCCAGA  
CAGTTCCATAATGTTTTTACGTGACGTGCCTTCCACCAGAATGCGCTGTGTCTGTGCCGAGCATACGGCGGCTCCA  
TGCCATCGCCTGCTGATTGATACGCTCTTGCAGAATATACAGACGCTGCTTTTTCTCTTCTTCCGGTACGTCATC  
AACCATATCGGCAGCCGGCGTTCCCGGACGCGCAGAGAAGATAAAGCTGTAGCTCATATCAAAGTTGACGTCAGC  
GATAAGCTTCATGGTTTTTTTCGAAATCATCGGTAGTTTCGCCAGGGAATCCGACGATAAAGTCAGAGCTTATCTG  
AATGTCCGGCCGCGCCGCGCAGTTTACGGATGATTGCTTTATATTCCAGCGCAGTGTGGGTGCGCCCCATCAG  
ATTCAACACGCGATCGGAACCGCTCTGTACCGGCAGATGCAGGAACTGACCAGCTCCGGCGTATCGCGGTACAC  
CTCGATAATATCGTCGGTGAACCTCAATCGGATGGCTGGTGGTAAAGCGAATACGGTCAATGCCGTCGATGGCGGC  
AACCAGACGCAGCAGATCGGCAAAGGTGCCAGTGGTGCCGTCGTAGTTTTCTCCGCGCCAGGCGTTAACGTTCTG  
GCCCCACAGGTTGACCTCACGCACGCCCTGCGCCGCTAACTGGGCGATTTTGAACAGGATATCGTCTGAGGGACG  
GCTGACTTCTTACCGCGGGTATACGGCACCCACGCAGTAAGTACAATATTTATTGCAGCCTTCCATGATAGAAAC  
GAAAGCGGTTCGGGCCTTCTGCGCGCGGTTCCGGCAAACGGTTCGAACCTTCTCGATTTCCGGGAAGCTGATATCGAC  
CACCGGGCTGCGGTGCGCCACGCACGGAGTTAATCATCTCCGGCAGGCGGTGTGAGGTTTTCGCGACCAAAAAATAAT  
GTCGACGTAATGGGCGCGTTGACGAATGTGCTCGCCTTCTTGGGAAGCCACGCAGCCGCCGACGCCGATAATCAG  
ATCGGGATTTTTCTCTTTTAAACAGTCTCCAGCGACCTAATTGATGGAAGACTTTTTCTGAGCCTTCTCGCGGAT  
TGAGCAGGTATTCAACAGCAGCACATCCGCCTCTTCCGCCACGTGCGTCAGTTGATAGCCGTGGGTGGCGTCCAG  
CAGATCGGCCATCTTCGATGAATCGTACTCGTTCATCTGACAGCCCCAGGTTTTAATATGGAGTTTTTTAGTCAT  
CGACTTGCTCTTGCGAAATAGTGGCTGAAAAGCAGGGCGCAT

**320. *Salmonella typhimurium* (SEQ ID NO. 320)**

TTAAGGCTGGTAGAATCCTACGCCCAGCTCATTTTCTTTACGGGTACGGGCAATGACGGACTCCGGCGTTTCGGC  
GACGCGCAGCCCCATTTTCATCTTCGGTACGCACCACCTTTCCGCGCAGGGAGTTTCGGATAGACGTCAGTAATTTTC  
CACATCGACAAACTTACCAATCATCTCCGGCGTGCCTTCAAAGTTCACCACCCGATTGTTTTTCGGTACGGCCAGA  
CAGTTCCATAATGTTTTTACGCGACGTGCCTTCCACCAGAATGCGCTGTGTCTGTGCCGAGCATACGGCGGCTCCA  
TGCCATCGCCTGCTGATTGATACGCTCTTGCAGAATATACAGACGCTGCTTCTTCTTCTTCCGGCACGTCATC  
AACCATATCGGCAGCCGGCGTTCCCGGACGCGCAGAGAAGATAAAGCTGTAGCTCATATCAAAGTTGACGTCAGC  
GATAAGCTTCATGGTTTTTTTCGAAATCATCGGTAGTTTCGCCAGGGAATCCGACGATAAAGTCAGAGCTTATCTG  
AATGTCCGGCCGCGCCGCGCAGTTTACGGATGATTGCTTTATATTCCAGCGCAGTGTGGGTGCGCCCCATCAG  
ATTCAACACGCGATCGGAACCGCTCTGTACCGGCAGATGCAGGAACTGACCAGTTCCGGCGTATCGCGGTATAC  
CTCGATAATATCGTCGGTGAACCTCAATCGGATGGCTGGTGGTAAAGCGAATACGGTCAATGCCGTCGATGGCGGC  
AACCAGACGCAGCAGATCGGCAAAGGTACCGGTGGTGCCGTCGTAGTTTTCTCCGCGCCAGGCGTTAACGTTCTG  
GCCCAGCAGGTTGACCTCACGCACGCCCTGCGCCGCTAACTGGGCGATTTTGAACAGGATATCGTCTGAGGGACG  
GCTGACTTCTTACCGCGGGTATACGGTACCACACAGTAAGTACAATATTTATTGCAGCCTTCCATGATAGAAAC

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GAAAGCGGTCGGGCCTTCTGCGCGGGTCCGGCAAACGGTCGAACTTCTCGATTTCCGGGAAGCTGATATCGAC  
CACCGGGCTGCGGTGCGCCACGCACGGAGTTAATCATCTCCGGTAGGCGGTGTAAGGTTTGCGGGCCAAAAATAAT  
GTCGACGTAATGGGCGCGTTGACGAATGTGCTCGCCTTCTGGGAAGCCACGCAGCCGCCGACGCCGATAATCAG  
ATCGGGATTTTTCTCTTTTAACAGTCTCCAGCGACCTAATTGATGGAAGACTTTTTCTGAGCCTTCTCGCGGAT  
TGAGCAGGTATTCAACAGCAGCACATCCGCCTTCTCCGCCACGTCGGTCAGTTGATAGCCGTGGGTGGCGTCCAG  
CAGATCGGCCATCTTCGATGAATCGTACTCGTTCATCTGACAGCCCCAGGTTTTAATATGGAGTTTTTTAGTCAT

**321. *Shigella flexneri* (SEQ ID NO. 321)**

TTACGGCTGATAATAACCCACGCCAAGGTCGTTTTCTTTGCGGGTGCGGGCAATCACCGACTCCGGTGTTTCTGC  
CATGCGCAGACCCATTTTCATCTTCAGTTCGCACCACCTTACC CGCGCAGAGAGTTCCGGTAGACGTCGGTAATTTCT  
TACATCGACGAATTTACCGATCATATCCGGTGTCCTCGAAGTTGACCACGCGGTTATTTTCGGTACGCCCGGA  
AAGCTCCATGATGCTCTTACGCGAAGTCCCTTCTACCAGAATACGCTGGGTGGTGCCGAGCATCCGACGGCTCCA  
TGCCATCGCTTGCTGATTGATACGTTCTTGCGAATATACAGACGCTGCTTCTTCTTCTTCCGGAACATCATC  
AACCATATCGGCGGCAGGCGTTCTTGACGTGCAGAGAAGATAAAGCTGTAGCTCATGTGAAATTGACGTCGGC  
AATCAGCTTCATCGTTTTCTCGAAGTCTTCGGTGGTTTCGCCAGGGAAGCCAACAATGAAGTCAGAACTGATCTG  
AATATCCGGACGCGCCGCACGCAGTTTACGGATGATCGCTTTGTACTCCAGCGCCGTATGGGTACGTCCCATCAG  
GTTTCAAGATGCGATCGGAACCGCTCTGTACCGGCAGATGCAGGAAGCTCACCAGCTCAGGCGTGTGCGGGTACAC  
TTCGATGATATCGTCGGTGAATTTCGATCGGATGGCTGGTGGTAAAGCGAATACGATCGATCCCGTCGATCGCAGC  
AACCAGACGCAACAGATCGGCAAACGATCCGGTGGTGCCGTCGTAGTTCTCACCACGCCAGGCATTACATTTCTG  
ACCGAGCAGGTTGACTTCACGCACGCCCTGAGCCGCAAGCTGGGCAATCTCAAACAGAATATCGTCAGACGGACG  
GCTTACCTCTTACCACGGGTGTAAGGCACCACGCAGTAGGTGCAATATTTATTGCAGCCTTCCATGATGGAGAC  
AAACGCGGTGCGGCCCTTCGGCGCGCGGTTCCGGCAGACGGTCAAACCTTCTCGATTTCCGGGAAGCTGATATCTAC  
AACCAGGCTGCGGTGCGCGCGCACGGAGTTGATCATCTCCGGCAGACGGTGCAGCGTTTGCGGGCCAAAAATAAT  
ATCGACATAGTGGGCGCGCTGGCGAATGTGCTCGCCTTCTTGCATGCCACGCAGCCACCGACGCCGATAATCAG  
GTCTGGATTCTTCTCTTTTAACAGTTTCCAGCGACCCAACTGATGGAAGACTTTTTCTGAGCCTTCTCGCGGAT  
TGAGCAGGTGTTTCAAGTAGCACATCCGCTTCTTCCGCCACGTCGGTCAGTTGATAGCCGTGGGTGGCATCCAG  
CAGATCGGCCATCTTCGATGAATCGTACTCGTTCATCTGACAGCCCCAGGTTTTAATATGGAGTTTTTTGGTCAT

**322. *Pseudomonas syringae* (SEQ ID NO. 322)**

TTACTGTAGCAGCGAGCCACGCAACGAGTGGGGCTGCGCATCATCAATGTGTACGTCGGCAAACCTGCCCCGATCAG  
GCGGGGATTGTGCGCAGCGAAAATTGACAATCCGGTTGTCTCGGTGCGACCTTGACGTTCCGCCGGGTCTTTCTT  
TGAGTAATCTGTAACCAGAATACGCTGGATGCTGCCAACCATCTGTCGGCTGATCTCGAAACCCTGTTGGTTTCA  
GCGATGTTGCAACGCGGCCAGTCGCTCTTTTTTTCAGCGCTTCCGGCGTGTGCTCTTTTCAGGTCAGCGGCCGGTGT  
GCCGGGGCGCGGGCTGTAAATGAACGAGAACGAGAAGTCGAAACCGGCGTCTTCGATCAGCTTCATGGTGTGTGTC  
GAAATCCTTTTTCGGTTTTACCGGGGAAGCCAACGATGAAGTCGGAACCTGATGCTGATACCGGCACTGCCGCCCC  
AAGCTTGCGTAGCCTGGACTTGTATTCCAGCGTGGTGTGGTTGCGTTTCATGGCCGCCAGAATGCGGTCCGAACC  
TGACTGCACCGGCAAATGCAGGTGCTTGACCAGTTCCGGCACGTCGGCGTGCGCTGAATCAGGCTGTGCGAAAA  
CTCGAGCGGGTGCGAGGTTGTGTAACGAATGCGGTGCGATGCCATCGACGACGGCAACTGCCCGAATCAGATCAGC  
CAAGTCGGCGACTCGCCCGTCATGGGTGGTGCCGCGATAACCGTTGACGTTCTGCCCCAGCAGTGTGACTTCGCG  
CACGCCGTGTTGCGCCAGGTGAGTGACCTCGGTGACGACGTCATCGAACGGTCGGTGACTTCTTCGCCGCGCGT

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GTAGGGCACCACGCAGAAGGTGCAGTACTTGCTGCAGCCTTCCATCACCGACACGTAAGCACTCGGGCCATCCAC  
GCGCGGCTCGGGCAAGTGGTCAATTTTTTCGATCTCGGGGAATGAAACATCGACCTGCGGCAAGCGGGTGATGCG  
CGCTGCGTCGATCATTTCCGGCAGGCGGTGCAATGTTTGCGGGCCGAACACCACGTCCACGTAGGGCGCGCGGT  
GCGGATGGCCGCGCCTTCTGGCTGGCAACACAGCCGCCGACGGCAATCACCATCTCGGGGTGGCCAGTTTCAG  
CTCACGCCAGCGGCCGAGCTGCGAATAGACCCGGTCTTGCGCACGCTCGCGAATCGAGCAGGTGTTGAGCAGGAT  
CACGTGCGCGTCTTCCGCGCGAGCGGTGACTTCCAGAGCCTGATGTTGCCCAGCAGATCGACCATGCGCGAGCT  
GTCGTACTCGTTCATCTGGCAACCGTGGGTTTCGATGTAAAGCTTCTTGCCAT

**323. *Burkholderia mallei* (SEQ ID NO. 323)**

TCAGTGCCTGGCGGCGCTCGCGTCGCCGTGCGCGAGCACGAGCTCGCCGCGCAGCGAGTGCGGATACGCGTGATT  
GATCTTCACGTGATCATCTGGCCGATCAGGCGCGGGTGCGCGGCGCTCGGCGCGGAAAATTCACGACCCGGTT  
GTTCTCGGTGCGGCCGCGAGCTCGTTCGGATCCTTGCGCGACGGCCCCCTCGACGAGGATTCGCTCGACCTTGCC  
GAGCATCGACTGGCTGATCCTCGCGACGTTCTCCTCGATCGTCGCCTGCAGATGTTGCAGGCGCTTGAGCTTGAG  
CTCGCGCGGCGTGTCTGTCGGCGAGATTTCGCGGCCGCGGTGCCGGGCCGCGGGCTGTAGATGAACGAGAAGCTCGT  
GTCGTAGCTCATCTCGTGAACGAGCGCCATCGTCTTGTCGAAGTCGGCGTCGGTCTCGCCGGGAAACCCACGAT  
GATGTCCGTGGACAGCGACAGATTGCGGCGGATCGCGCGCAGCTTGGCGATCACCGATTTGTATTGAGCACGGT  
GTAGCCGCGCTTCATCGCCATCAGGATGCGGTCCGAGCCGTGCTGGACGGGCAGGTGCAGATGGTCGACGAGCTT  
CGGCACCTTCGCGTAGACGTGAGCAGGCGCTGCGTGAACCTTTTCGGATGCGATGTCGTGTAGCGGATCCGCTC  
GATGCCGGGGATGTGCGCGACATATTCGATCAGCGTCGCGAAATCGGCGATCTCGGCCGAGCCGGCCGCGATCGC  
GCCGCGGTAGGCGTTCACGTTCTGGCCGAGCAGCGTGACTTCGCGCACGCCCTGGTCGGCGAGGCCGCCACCTC  
GGTCAAGACGTCGTGAGCGGGCGCGACACTTCATCGCCGCGCGTGTACGGCACGACGCAGTAGCTGCAGTACTT  
CGAGCAGCCTTCCATGATCGACACGAACGCGCTCGGCCCTTCGACGCGAGCGGGCGGCAGATGGTCGAACCTTCTC  
GATTTGCGGGAACGTGATGTGACCTGCGCGCGGCCGCTTTTCGCGCGCGCGTCGATCATCTGCGGCAGGCGGTG  
CAGCGTTTGCGGGCCGAACACGAGATCGACGTACGGCGCGCGCGACGATCGACGCGCCTTCTGGCTCGCCAC  
GCAGCCGCCGACGCCGATCAGCAGGTCCGGCTTTCGCTTCTTCAGCTCGCGCACGCGGCCGAGATCGGAGAACAC  
CTTCTCCTGCGCCTTTTCTCGCACCGAGCAGGTGTTGAACAGGATGATGTCCGCGTCTTCGGGGTGTCGGTTTT  
CTCGAGGCCCTCGGCCGATTGAGCACGTGACCATCTTGTCGGAGTCGTACTCGTTCATCTGGCAGCCGAAGGT  
TTTTACGTAACTTTCTTGGTCAT

**324. *Legionella pneumophila* (SEQ ID NO. 324)**

TTAGGCTGGCTGCATCTCCTTTTCAAGCAGCCTTCTCGCAATGAATTAGGTAGTGCGTCACTAATTTGGACATC  
TATAAATTGTCCAATTAAATGAGGTGGTCCATCAAAATTAACACGATTACATTACGTACGACCAGATAATTG  
CTGTGAACTTTTCTTGAAAATCCGGTAACCAGAATTTTTTGCTTGCTGCCTATCATTGATTAAGTAAACGAGC  
TGCAATTCATTAATAATCTGTTTTGTAAAATCTGTAAACGTTGCTTTTTGATCTCCATAGGCGTGTATCAGGTAA  
ATTTGCTGCAGGAGTTCCTGGTCTTGGGCTGTATATAAAGCTGAAAGAGGTATCAAAACCGATTCATGCACAAG  
ATCCATAGTGTCTTGAAATCTTTGTCTGTCTCTCCGGGAAAGCCTACAATAATGTCAGTAGATAAGCGAATGTC  
TGGTCGAATTTTCTTAATTTACGAATTTTGGATTTAAATTCCAAAGCAGTGACCTCGTTTCATTAACGATAA  
AATGCGATCGGATCCGCTTGTACCGGAAGGTGTAAATGATTGGCAAGCTCTGGAACCTCAGCGTAGGCATTAAT  
CAAATTTTCAGAAAATGCCAAGGGATGTGATGTTGTGAAACGTATTCTTCCTATTCCATCGATAGCGGCAATATA  
ATGAATTAACAGGGCAAGATCGGCTATATCCCCATTGTCCATAATACCTCTGTAATCGTTACATTTTGGCCTAG

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TAAATTAATCTCTCTGACGCCCTTGACTGGCTAATTGATAAACTCAGCCAATACATCATCAAATGGTCTGCTGAT  
TTCTTCGCCACGGGTGTAGGGACCACACAGAAGCTGCAATATTTACTACAGCCTTCCATTATAGATACAAAAGC  
TG TAGGGCCTTCTGCTCTTGGTGCGGGTAAATGATCAAATTTCTCTATTTCTGGAAAGCTGATATCAACAACAGA  
TTTATTTTTCTCAAGCCTTTCATTGAGCAGGGCAGGGAGCCTGTGTAATGTCTGTGGCCCAAATACGATATCAAC  
AAACGGTGCTCTTTTTATGATGTCTGAGCCTTCCTGGCTCGCTACGCATCCTCCCACTCCAATGAGCACATGAGG  
GTTTTTGGCTTTATATTCTCGCCATTGACCCAGTTGAGAAAAAACTTTTTCTGTGCTTTTTCTCGAATTGAGCA  
TGTGTTTAATAAAAATAACATCGGCATCCTCGACTTGATCAGTTTTGACCAAACCATGGGAAGCGTAAAGTACTTC  
TGCCATTTTAGAAGAATCGTATTCATTCATTTGGCAGCCATTTGTTTTAATATATAATTTTTTAACCAT

**325. *Bordetella bronchiseptica* (SEQ ID NO. 325)**

TCATTCGGCTCCGGATGTGTGCGTTTCGATGCCGGCGACACGGCCGCGCAGCGAGTTGGTGTGGGCGTGGGTGAC  
GACGACGTCGACCATGTGGCCGATCAGGCGCGGCACGCCGGGAAAGTTGACGATACGGTTGTTCTCGGTACGGCC  
CATCAGCTCGTTGGGGTCGCGCCGCGAAGGGCCTTCGACCAGCACGCGCTGGCGGGTGCCGATCATGCCCTGGGC  
GATGGCCGCGGCCTGCTGGTTGATGAGCGCCTGCAACTGCTGCAGGCGGCGCAGCTTGACGTCCTGCGGCGTGTC  
ATCGTGCAAGTTCGGCGGCCGGCGTGCCGGGCCGGCGCGAATACACGAACGAGAACGAGGTGTGGAAGCCGACGTC  
CTCGATCAGCTTCATGGTCTTCTGGAAGTCCTCCTCGGTCTCGCCCGGAAACCGACGATGAAGTCCGAGGACAG  
CGTCAGGCTGGGGCGCGCAGCGCGCAGGCGGCGCACCACGGAAGTTCGAACTCCAGCGCGGTGTAGCCGCGCTTCAT  
GGCCGCCAGCACCCGGTCGCTGCCGGCCTGCACCGGCAGGTGCAGGAACGACACCAGCTTGGGCAGCCGTGCGTA  
GGCGTCGACCATGCGCTGGGTCAATTCCTTCGGATGCGAGGTGCTGTAGCGGATCCGTTGATACCGGGAATCTC  
GTGCACGTATTCAGCAGCATGGCGAAATCGGCGATTTGCGCGCTGTGCGCCATGGCGCCGCGGTAGGCGTTGAC  
GTTCTGGCCCAGCAGCGTGAATTCCTTGACGCCCTGGTGGCCAGGTGCGCGACCTCGAGCAGGACGTCGTCGAA  
GGGCCGCGACACTTCTTCGCCGCGCGTGTAGGGACCACGCGAGAAGCTGCAATACTTGCTGCAGCCTTCCATGAT  
GGACACGAACGCGGTGGCGCCGTGACGCGCGGCGGGGCGAGGGCGTCGAACTTCTCGATCTCGGGAAAAGCTGAT  
GTCGACCTGCGACACGCCCTGGGCGCGGCGGCGCTTGATCAGGTGCGGCAGCCGGTGCAGGGTCTGCGGGCCGAA  
CACCACGTCGACATAGGGCGCGCGCTTGACGATGGCCTCGCCCTCCTGGCTGGCCACGCAGCCGCCACGCCGAT  
CACCAGGTGGGGTTCTGCTTCTTGAGGTGCTGTACCCGGCCCAGGTGCGAGAACACCTTCTCCTGCGCCTTCTC  
GCGCACGGAACAGGTGTTGAACAGGATGACATCGGCATCCTCGGGGTTGTGGTCAGCTCCAGGCCCTGGTCGGC  
GCGCAGCACGTCGGCCATCTTGTCCGAGTCGTAATCGTTTCATCTGGCAGCCGAAGGTGCGGATATACAATTTGCC  
CAGGCCCTGGGCGGTGGTGGCCGGCGTGCCGGCATCGGACGGGCTGGCGCCGTGCGGTTTGACAGTGGTTTCTTG  
CAT

**Figure 14 represents marker I (purA) sequences amplified from different Gram-positive bacteria (SEQ ID NOs 326-359)**

**326 *Enterococcus faecalis* (SEQ ID NO. 326)**

CTATTTGAAGGGCGCAAGGTGTCATGTTGGATATCGATCAAGGAACCTATCCATTTGTTACTTCCTCTAATCCAG  
TAGCTGGTGGCGTAACATATCGGTAGTGGCGTTGGTCCATCAAAAATTAATAAAGTGGTTGGTGTCTGCAAAGCGT  
ACACTTCACGTGTCGGTGACGGCCCATTCCCAACAGAATTATTTGATGAAACAGGAGAAACCATTCGTCGTGTCTG  
GTAAAGAATACGGAACAACAACAGGACGTCCGCGTCGTGTCTGGTTGGTTGATTTCAGTAGTCATGCGTCATTCAA  
AACGTGTATCAGGGATTACAACTTGTCTAACTCGATTGACGTGTTAAGTGGTTTAGAAACGGTGAAAATTT  
GTACAGCTTATGAACTTGATGGTGAATTAATTTATCATTATCCAGCAAGCTTGAAAGAATTAAGCCGCTGTAAAC  
CAGTTTATGAAGAATTACCAGGTTGGTCTGAAGATATCACTGGTTGCAAACTTTAGCCGATTTACCAGCTAATG  
CTCGTAACTATGTGCATCGGATTTTCAAGATTAGTTGGTGTGCGCATTTCAACATTCTCAGTAGGGCCAGACC

**327 *Enterococcus gallinarum* (SEQ ID NO. 327)**

CTCTTCGAGGTGCGCAAGGAGTTATGCTAGATATTGATCAAGGAACATATCCGTTTCGTAACATCCTCAAATCCAG  
TAGCTGGTGGAGTAACCATTTGGTAGTGGAGTGGGTCTTCTAAAATCAATAAAGTAGTTGGTGTGTGTAAAGCAT  
ATACTTCAAGAGTTGGTGACGGCCCATTCCCAACAGAACTTTTTGATGAAACAGGCAATCAAATTCGTGAAGTTG  
GCCGTGAATATGGTACGACAACCTGGTCGTCCACGTCGTGTTGGTTGGTTTGAATCTGTTGTCATGCGTCATTCAA  
AACGTGTTTCTGGTATCACGAATCTGTCTTTAAATTCAATTGATGTTTTGAGCGGCTTGGAACGTGAAAAATTT  
GTACTGCTTATGAATTAGATGGAGAATTGATTTATCATTATCCTGCAAGTCTAAAAGAATTGAATCGTTGTAAAC  
CAGTCTATGAAGAGTTACCAGGCTGGTCAGAAGATATTACTGGATGCAAAACATTAGCTGATCTTCTGAAAATG  
CACGTAACATATGTACATCGTATCTCTGAATTAGTTGGGGTTCGTATCTCAACATTCTCAGTAGGTCCTGACC

**328 *Enterococcus flavescens* (SEQ ID NO. 328)**

CTTTTTGAAGGTGCTCAAGGCGTGATGCTGGATATCGACCAAGGAACCTATCCTTTTCGTGACATCATCCAACCCC  
GTTGCTGGGGGAGTCACTATTGGTAGTGGTGTGGGTCTTCAAAAATCAACAAAGTCGTTGGTGTCTGCAAAGCT  
TACACCTCTCGGGTAGGAGATGGTCTTTCCCAACGGAAGTGTGTTGATGAAACAGGTGAACAAATCCGTAAGATC  
GGTCGTGAATACGGAACAACGACAGGACGTCCTCGCCGTGTGGGCTGGTTTGATACCGTCGTGATGCGCCATTCA  
AAACGTGTTTCAGGGATTACAAACCTATCCCTTAACGATCGATGTCTTGAGCGGCTTAGAAACCGTGAAGATC  
TGTACGGCTTATGAACTAGACGGCGAATTGATCTATCATTACCCAGCAAGCTTGAAAGAGTTGAACCGCTGCAAA  
CCAGTCTACGAAGAACTTCCTGGCTGGTCTGAAGACATTACTGGCTGCAAAACATTAGCAGATCTGCCAGAAAAT  
GCACGCAATTACGTTACCCGCATCTCTGAATTAGTCGGTGTCCGCATTTTCGACCTTCTCAGTAGGGCCNGACC

**329 *Streptococcus agalactiae* (SEQ ID NO. 329)**

CTCTTTGAAGGGCGCAAGGAGTTATGCTCGACATTGATCAAGGAACATACCCATTTGTAACATCTTCCAATCCAG  
TAGCAGGTGGTGTCACAATTGGTTCGGGAGTTGGACCAAGTAAATTAATAAAGTAGTAGGTGTATGTAAAGCTT  
ACACTAGCCGTGTTGGTGTGATGGACCATTCCTCAACAGAAGTGTGTTGATGAGGTTGGTGACCGTATTCGTGAGATTG  
GTAAAGAGTATGGTACAACGACCGGTCGTCTCGTCGCGTTGGATGGTTTGATTCTGTTGTTATGCGTCACAGCC  
GTCGAGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTTCAGGGCTTGATACGGTGAAAATTT  
GTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAGCCTTGAACAGCTAAAACGTTGTAAAC

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CAATCTATGAAGAATTACCGGGCTGGTCTGAAGATATTACAGCTTGTCTAGCTTAGATGATCTTCCAGAAAATG  
CACGTAATTACGTTCCCGTGTTGGCGAATTGGTTGGTGTTCGTATTTCTACTTTNCTCAGTAGGNCCAGGTC

**330 *Streptococcus sanguis* (SEQ ID NO. 330)**

CTTTTTGAAGGGGCTCAAGGAGTTATGCTCGACATTGATCAAGGAACATACCCATTTGTAACATCTTCCAATCCA  
GTAGCAGGTGGTGTCACAATTGGTTCCGGGAGTTGGACCAAGTAAAATTAATAAAGTAGTAGGTGTATGTAAAGCT  
TACACTAGCCGTGTTGGTGATGGACCATTCCCAACAGAACTTTTTGATGAGGTTGGTGACCGTATTCGTGAGATT  
GGTAAAGAGTATGGTACAACGACCGGTCTCTCGTCGCGTTGGATGGTTTGATTCTGTTGTTATGCGTCACAGC  
CGTCGAGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTCAGGGCTTGATACGGTGAAAATT  
TGTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAGCCTTGAACAGCTAAAACGTTGTAAA  
CCAATCTATGAAGAATTACCGGGCTGGTCTGAAGATATTACAGCTTGTCTAGCTTAGATGATCTTCCAGAAAAT  
GCACGTAATTACGTTCCCGTGTTGGCGAATTGGTTGGTGTTCGTATTTCTACTTTCTCAGTTGGGTCCAGACC

**331 *Enterococcus faecium* (SEQ ID NO. 331)**

TTCTTCGAAGGGGCGCAAGGGGTTATGCTGGATATTGACCAAGGGACTTATCCATTTGTAACCTCTTCTAATCCA  
GTTGCAGGGGAGTCACCATCGGTTCCGGTGTTGGTCCGAGCAAAATTGACAAGGTAGTTGGTGTCTGCAAGGCCT  
ACACCAGTCGGGTCGGAGATGGACCATTCCCAACAGAGCTTTTTGATGAAGTTGGTGACCGCATTCGTGATATCG  
GCCACGAATATGGCACTACCACTGGTCGCCCCAGTCGGGTAGGTTGGTTTACTCGGTTGTTATGCGCCATAGCC  
GCCGTGTATCAGGGATTACCAATCTTTCGCTTAACCTCCATCGATGTCTTGAGTGGTCTGGATACAGTGAAAATCT  
GTGTAGCTTATGACTTGGATGGCCAAAGAATCGACCACTACCCAGCTAGTCTGGAACAGCTCAAGCGCTGCAAGC  
CGATTTACGAAGAGCTGCCAGGCTGGTCAGAGGACATCACTGGAGTCCGCAGTCTGGAAGACTTGCCAGAAAATG  
CCCCTAACTATGTTCCGCCGAGTGAGTGAGCTGGTTGGCGTTTCGCATTTCTACCTTCTCAGTAGGGCCAGACC

**332 *Enterococcus durans* (SEQ ID NO. 332)**

CTCTTTGAAGGGGCACAAGGTGTGATGTTGGATATCGATCAAGGAACGTATCCATTTGTGACTTCTTCTAATCCG  
GTAGCTGGTGGTGTAAAGATCGGTAGTGGCGTTGGCCCTTCAAAGATCAATAAAGTCGTTGGTGTATGTAAAGCT  
TATACTTCTCGTGTAGGAGATGGCCCATTCCCAACAGAACTATTTGACGAAACAGGTCAACAAATCCGTGAAGTC  
GGTCGTGAATATGGTACGACAACAGGTGACCTCGTCGTGTCGGTTGGTTTGATACAGTCGTGGTGCGCCATTCA  
AAACGTGTATCAGGAATCACTAACCTATCATTGAATTCAATCGATGTATTAAGCGGACTAGAAACAGTAAAAATC  
TGTACAGCGTATGAATTAGATGGAGAATTGATCTATCATTACCCAGCAAGCCTGAAAGAATTGAAACGTTGCAAA  
CCAGTATACGAAGAACTTCCTGGTTGGTCTGAAGATATTACAGCATGTAAAACACTTGCTGAACTACCAGAAAAC  
GCCCGTAACTATGTTAGACGTATCTCAGAGCCTGTAGGAGTCCGTATTTCAACATTCTCAGTAGGTCCAGACC

**333 *Streptococcus pyogenes* (SEQ ID NO. 333)**

CTATTTGAAGGGGCGCAAGGGGTTATGCTTGATATTGACCAGGAACGTACCCATTTGTAACGTCTTCAAACCCAG  
TTGCTGGTGGTGTAAACATTGGTTCTGGTGTGGCCCAAATAAAATCAACAAAGTAGTTGGTGTCTGTAAAGCCT  
ACACAAGCCGTGTCGGTGATGGGCCATTCCCTACAGAACTCTTTGATGAAGTGGGTGAGCGCATTCGTGAAGTGG  
GTCATGAGTACGGGACAACGACCGGCCGTCCACGTGTCGTGTCGGTTGGTTTGATTCCGGTTGTCATGCGCCACAGTC  
GTCGTGTATCAGGTATTACTAACCTCTCTCTGAATTCAATTGATGTTCTTTCAGGGCTTGATACGGTTAAGATTT  
GTGTGGCTTATGACCTTGATGGGAAACGTATTGACTATTACCCAGCAAACCTTGAACAACCTCAAACGTTGCAAAAC

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CAATCTATGAAGAATTACCAGGCTGGCAAGAGGACATCACAGGTGTTTCGTAGCCTTGATGAGCTTCCTGAAAATG  
CCCGCAACTACGTTTCGTTCGTGTTGGAGAATTGGTTGGCGTTCGCATTTCAACCTTCTCAGTTGGGCCAGACC

**334 *Streptococcus pneumoniae* (SEQ ID NO. 334)**

CTATTTGAAGGGGCTCAAGGTGTTATGCTAGATATCGACCAAGGTACTTATCCATTTGTTACGTCATCAAACCCCT  
GTAGCTGGTGGTGTGACAATTGGTTCTGGTGTCCGTCCAAGCAAGATTGACAAGGTTGTAGGTGTATGTAAAGCT  
TATACGAGTCGTGTAGGAGATGGTCCTTTCCCAACTGAGTTGTTTGATGAAGTGGGAGAACGTATCCGTGAAGTG  
GGTCATGAATATGGTACAACAACCTGGTCGTCCACGTCGTGTAGGTTGGTTTGACTCAGTTGTGATGCGTCATAGC  
CGTCGTGTTTCTGGTATTACTAACCTTTCTTTGAACTCTATTGATGTTTTGAGCGGTTTGGATACTGTGAAAATC  
TGTGTGGCCTATGATCTTGACGGTCAACGTATTGACTACTATCCAGCTAGTCTTGAGCAATTGAAACGTTGCAAG  
CCTATCTATGAAGAGTTGCCAGGTTGGTCAGAAGATATTACCGGAGTTCGCAATTTGGAAGATCTTCCTGAGAAT  
GCGCGTAACTATGTTTCGTTCGTGTGAGTGAATTGGTTGGCGTTCGTATTTCTACTTTTCTCAGTAGGTCCAGGCC

**335 *Streptococcus oralis* (SEQ ID NO. 335)**

CTTTTCGAAGGTGCGCAAGGTGTCATGTTGGACATTGATCAAGGGACTTATCCATTTGTTACTTCTTCAAACCCCT  
GTCGCTGGTGGTGTGACGATTGGGTCTGGTGTGGTCCAAGTAAGATTGACAAGGTTGTAGGTGTCTGTAAAGCC  
TACACAAGTCGTGTAGGAGATGGACCGTTCCCAACTGAATTATTTGATGAAGTGGGAGATCGCATCCGTGAAGTA  
GGTCATGAATATGGTACAACAACCTGGTCGTCCACGTCGTGTGGGTTGGTTTGACTCAGTTGTGATGCGTCACAGC  
CGCCGTGTATCTGGGATTACCAATCTTTCATTGAACTCTATAGATGTTTTGAGTGGTTTGGATACTGTGAAAATC  
TGTGTGCGCTATGATCTTGATGGTCAACGTATTGATTACTATCCTGCTAGTCTTGAGCAGTTGAAACGTTGTAAG  
CCAATCTACGAGGAATTGCCAGGTTGGTCAGAAGACATCACTGGAGTCCGTAATTTGGAAGACCTTCCTGAGAAT  
GCACGCAACTATGTTTCGTTCGTGTAAGCGAGTTGGTTGGTGTTCGTATCTCAACTTTCTCAGTTGGGCCAGATC

**336 *Staphylococcus hominis* (SEQ ID NO. 336)**

CTCTTTGAAGGAGCGCAAGGAGTTATGTTAGATATCGACCATGGTACATATCCTTTTGTAACGTCAAGTAATCCT  
GTGGCAGGTAATGTGACAGTAGGAAGTGGCGTGGGTCCAACCTTCGTATCTAAAGTGATTGGGGTATGTAAATCC  
TATACATCTCGTGTAGGTGACGGCCCATTCCCTACTGAATTATTCGACGAAGATGGTCATCATATTAGAGAAGTA  
GGTCGTGAATATGGAACGACAACAGGACGTCTCGTCGTGTAGGTTGGTTCGACTCAGTTGTATTACGTCACTCT  
CGTCGTGTAAGTGGTATTACAGACTTATCTATTAACCTCAATTGACGTTTTAACAGGTTTAGATACGGTTAAATTT  
TGTACAGCTTATGAGTTAGATGGTGAAACAATCACAGAATATCCAGCAAACCTTAGACCAATTACGTCGTTGTAAA  
CCAATTTTCGAAGAGTTACCTGGTTGGACGGAAGACATTACAGGTTGTCGTACATTAGAAGAATTACCTGAAAAC  
GCACGTAAATACTTAGAACGTATTTCTGAATTATGTGGCGTTCATATTTCAATCTTCTCAGTAGGTCCAGGCC

**337 *Bacillus anthracis* (SEQ ID NO. 337)**

CTATTTGAAGGTGCTCAAGGTGTTATGCTTGATATCGACCACGGTACGTACCCGTTTCGTTACATCTTCTAACCCA  
ATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCA  
TATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTGAGCTTCATGACGAAATTGGTCATCAAATTCGTGAAGTT  
GGTCGTGAGTATGGAACGACAACCTGGTCGTCCACGCCGCGTAGGTTGGTTCGATAGCGTTGTTGTAAGACATGCA  
CGTCGTGTTAGTGGTTTAAACAGATTTATCATTAACCTCTATCGACGTTCTAACTGGTATTCCAACACTTAAATTT  
TGTGTTGCTTACAAATGCGATGGGAAAGTTATCGATGAAGTTCAGCAAACCTTAAACATTTTAGCGAAATGTGAG



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CCTGTATACGAAGAGCTTCCAGGTTGGACAGAAGATATTACTGGTGTAAAGATCATTAGATGAGCTTCCTGAAAAT  
GCTCGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAGTTCAATTATCTATGTTCTCAGTAGGGCCAGACC

**338 *Bacillus cereus* (SEQ ID NO. 338)**

GACNCGGTACGTACCCGTTTCGTTACATCTTCTAACCCAATTGCTGGTGGTGTAAACAGTTGGAAGTGGAGTTGGTC  
CTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGCGTTGGTGATGGTCCATTCCCTACTG  
AGCTTCATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGCGAGTATGGAACGACAAGTGGTCGTCCACGCC  
GCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAAACGGATCTATCATTTAAATT  
CTATCGACGTTTTTAACAGGTATTCCAACCTTAAATTTGTGTAGCTTACAAATACAATGGCGAAGTTATTGATG  
AAGTTCCAGCTAACTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGGAAGAAGATA  
TTACTGGTGTAAATCATTAGATGAACTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAG  
GAATTCAAATATCTATGTTCTCAGTAGGTCCCCACCA

**339 *Bacillus megatherium* (SEQ ID NO. 339)**

CTATTCGAAGGGGCACAAGGTGTTATGTTAGATATCGATCAAGGAACATATCCATTTGTTACATCTTCAAACCCA  
GTAGCGGGTGGAGTAACAATTGGTTCTGGGGTAGGTCCATCTAAAATCAAACACGTTGTAGGTGTATCAAAAGCG  
TATACAACCTCGTGTTGGTGACGGCCCTTTCCCAACTGAATTAACAAACGAAATCGGTGATCAAATCCGTGAAGTA  
GGACGTGAATATGGTACAACAACCTGGTCGTCTCGCCGTGTAGGTTGGTTCGACAGTGTAGTTGTACGTCATGCT  
CGTCGCGTTAGTGAATCACAGATCTATCTTTAACTCAATTGATGTATTAACGGGAATTGAGACATTAAAGATT  
TGCGTAGCTTATCGTTATAAAGGGGAAGTTATGGAAGAATTCCTGCTAGCTTAAAAACACTTGCAGAGTGCGAA  
CCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACGGGTGTGAAAACATTAGATGAGTTACCTGATAAC  
GCTCGCCACTACTTAGAGCGCGTGTCTCAATTAACAGGTATTCTTTTATCTATTTTCTCAGTAGGTCCAGGCC

**340 *Enterococcus casseliflavus* (SEQ ID NO. 340)**

TATTCGAAGGNAGCTCAAGGCGTGATGCTGGATATCGACCAAGGAACCTATCCTTTTCGTGACATCATCCAACCCC  
GTTGCTGGAGGTGTACCATCGGTAGTGGTGTGGGTCTTCAAAAATCAACAAAGTCGTTGGTGTCTGCAAAGCT  
TACACCTCTCGGGTAGGAGATGGTCCTTTCCCAACGGAAGTGTGATGAAACAGGTGAACAAATTGTAAGATC  
GGTCGTGAATACGGAACAACGACAGGACGTCTCGCCGTGTGGGCTGGTTTGATACCGTCGTGATGCGCCATTCA  
AAACGGGTCTCAGGGATCACGAATCTATCCCTTAACTCGATCGATGTCTTGAGCGGCTTAGAAACCGTGAAGATC  
TGTACGGCTTATGAACTAGACGGCGAATTGATCTATCATTACCCAGCAAGCTTGAAAGAGTTGAACCGCTGCAAA  
CCAGTCTACGAAGAACTTCCTGGCTGGTCTGAAGACATTACTGGCTGCAAAACATTAGCAGATCTGCCAGAAAAT  
GCACGCAATTACGTTACCGCATCTCTGAATTAGTCGGTGTCCGCATTTTCGACCTTCTCAGTAGGTCCAGACC

**341 *Enterococcus raffinosus* (SEQ ID NO. 341)**

CTATTTGAAGGTGCTCAAGGCGTTATGCTGGATATTGATCAAGGAACCTATCCATTTGTTACTTCTTCGAACCCA  
GTTGCCGGTGGGGTAACTATCGGTAGTGGTGTAGGACCTGCTAAAATCGACAAAGTTGTCGGTGTGTTGTAAAGCC  
TATACTTCACGCGTAGGTGATGGACCTTTCCCAACTGAATTGTTTGATGAAGTTGGAGATCAGATTGCTGAAGTC  
GGTCGTGAATATGGAACGACTACTGGTCGTCCACGTCGTGTGGGCTGGTTTGACTCGGTTGTGATGCGTCATTCA  
AAACGTGTTTCTGGGATTACGAATCTTTCTTTAACTCGATTGATGTCTTGAGCGGTCTGGATACAGTGAAAATT  
TGTACAGCGTATGAGCTGGACGGAGAATAATTTACCATTATCCAGCAAGCCTAAAAGAATTAAATCGTTGTAAG

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CCCGTTTATGAAGAACTACCTGGTTGGAGCGAAGATATTACAGGCTGCCGTGATTTAGCTGATCTACCGGAAAAT  
GCGCGTAATTATGTACGTCGCGTTTCTGAACTTGTGGGTGTGCGTATCTCGACCTTCTCAGTTGGTCCTGGTC

**342    *Staphylococcus aureus* (SEQ ID NO. 342)**

CTATTTGAAGGGGCACAAGGTGTAATGTTAGATATCGACCATGGTACATATCCATTTCGTTACATCAAGTAATCCA  
ATTGCAGGTAACGTTACTGTTGGTACAGGTGTAGGTCCTACATTTCGTTTCAAAGGTAATTGGTGTATGTAAAGCT  
TATACATCACGTGTTGGTGTATGGTCCATTCCCTACTGAATTATTCGATGAAGATGGACATCATATTAGAGAAGTT  
GGTCGTGAATATGGTACAACAACAGGACGTCCACGTCGTGTAGGTTGGTTTGATTTCAGTTGTATTACGTCACTCT  
CGTCGTGTAAGTGGTATTACAGATTTATCTATTAAGTCAATCGATGTTTTAACAGGCCTAGACACAGTGAAAATC  
TGTACAGCTTATGAATTAGACGGTAAAGAAATTACTGAGTACCCAGCAAACCTTAGATCAATTTAAACGTTGTAAA  
CCAATCTTTGAAGAGTTACCAGGTTGGACAGAAGACGTAACAAGTGTGCGTACTTTAGAAGAATTACCTGAAAAT  
GCACGTAAATATTTAGAGCGTATTTTCTAGAAATTATGTAATGTACAAATTTCTATCTTCTCAGTAGGTCCAGGCC

**343    *Staphylococcus epidermidis* (SEQ ID NO. 343)**

CTCTTCGAAGGTGCTCAAGGTGTCATGTTAGATATCGACCATGGTACATATCCATTTCGTTACATCTAGTAATCCA  
GTTGCAGGTAACGTTACAGTAGGTACAGGTGTTGGCCCTACATCAGTGTCTAAAGTGATTGGTGTATGTAAATCA  
TATACATCTCGTGTAGGTGACGGTCCATTCCCACTGAACCTTTTGTATGAAGATGGCCACCATATTAGAGAAGTG  
GGTCGTGAATATGGTACAACACTACTGGACGTCCACGTCGTGTAGGTTGGTTTCGACTCAGTTGTATTACGTCATTCA  
CGTCGTGTAAGTGGTATCACAGATCTTTCAATTAAGTCAATCGACGTTTTAACAGGATTAGACACAGTTAAAATT  
TGTAAGTGTATGAATTAGATGGTGAAGAAATTACTGAATACCCAGCAAACCTTAGATCAATTAAGACGTTGTAAA  
CCTATCTTCGAAGAGCTTCCAGGTTGGACTGAAGACATTACAGGTTGTCGTAGTTTAGATGAACTTCCTGAGAAT  
GCACGTAATTACTTAGAGCGTATTTTCTAGAAATTATGCGGTGTCCATATTTCAATCTTCTCAGTAGGTCCCTGGTC

**344    *Streptococcus mitis* (SEQ ID NO. 344)**

TATGGCTAGCNATAGACCAAGGTACGTATCCATTTGTTACGTCATCAAACCCTGTGGCTGGTGGTGTACGATTG  
GTTCTGGTGTGGTCCAAGTAAGATTGACAAGGTTGTAGGTTTATGTAAAGCCTATACGAGTCGAGTAGGAGACG  
GTCCTTTCCCACTGAATTGTTTGATGAAGTGGGAGAACGTATCCGTGAAGTTGGTCATGAATATGGTACAACAA  
CTGGTCGTCCACGTCGTGTGGGTTGGTTTGACTCAGTTGTGATGCGTCATAGTCGTGTTTCTGGTATTACTA  
ATCTTTTCATTGAACCTCTATCGATGTTTTGAGTGGTTTAGATACAGTGAAAATCTGTGTGGCCTATGATCTTGATG  
GTCAACGTATTGACTACTATCCAGCTAGTCTTGAGCAATTGAAACGTTGCAAGCCTATCTATGAAGAGTTGCCAG  
GTTGGTCAGAAGATATTACTGGAGTTCGTAATTTGGAAGATCTTCCTGAGAATGCGCGTAACCTATGTTTCGTGCTG  
TGAGTGAATTGGTTGGCGTTCTGATTTCTACTTTCTCAGTAG

**345    *Streptococcus species* (SEQ ID NO. 345)**

ATGGCTTGCTATTGACCAAGGGTACATACCCATTTGTAACATCATCTAACCCAGTCGCTGGTGGTGTAAACAATCG  
GTTCTGGTGTGGTCCAAGTAAATCAACAAAGTTGTCGGTGTATGTAAAGCCTACACAAGCCGTGTTGGTGACG  
GACCATTTCCCACTGAACCTTTTAGACGAAGTTGGTGACCGCATCCGTGAAGTGGGTACGAATATGGGACAACAA  
CTGGACGTCCACGTCGTGTTGGTTGGTTTGACTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGTATCACAA  
ACTTGTCACTTAAGTCAATTGACGTTCTTTCAGGTTCTGATACGGTCAAAATCTGTGTGGCATAACGACCTTGACG  
GTCAACGTATCGACCACTACCCAGCAAGCCTTGAACAATTGAAACGTTGTAAACCAATCTACGAAGAATTGCCAG

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GTTGGTCAGAAGACATCACAGGTTGCCGTAGCCTAGATGAACTTCCCGAAAATGCTCGTGACTACGTTCGCCGTG  
TTGGTGAACTCGTTGGTGTTCGCATTTCAACATTCTCAGTTGGCCCC

**346 *Streptococcus canis* (SEQ ID NO. 346)**

TGGCTTGCNATCGACCAAGGTAACCTATCCCATTTGTTACTTCTTCAAACCCAGTTGCTGGTGGGGTAACAATCGG  
TTCAGGTGTTGGTCCAAGCAAGATCAATAAAGTTGTCCGTGTATGTAAAGCTTACACAAGCCGTGTTGGTGACGG  
TCCGTTCCCAACAGAACTTCTAGATGAAGTTGGAGATCGTATCCGTGAAATTGGTCACGAATATGGTACAACAAC  
TGGACGTCCACGTCTGTGGTTGGTTTGGTCTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGTATCACAAA  
CTTGTCACTTAACTCAATCGATGTTCTTTCAGGACTTGATACTGTTAAAATCTGTGTGGCATACGACCTTGACGG  
TCAACGTATCGACCACTACCCAGCAAGTCTTGAACAATTGAAACGTTGTAAACCAATCTACGAAGAATTGCCAGG  
TTGGTCAGAAGACATCACAGGTTGCCGTAGCCTAGATGAACTTCCCGAAAATGCTCGTGACTACGTTCGCCGTGT  
TGGTGAACTCGTTGGTGTTCGCATTTCAACATTCTCAGTTGGCCCC

**347 *Streptococcus mutans* (SEQ ID NO. 347)**

TATGGCTTGCNATTGACCAAGGTAACCTATCCATTTGTAACCTCATCAAATCCAGTTGCAGGTGGCGTTACCATC  
GGATCTGGTGTGGACCAAGTAAAATCAATAAGGTTGTTGGTGTCTGCAAAGCCTATACCAGCCGTGTAGGTGAT  
GGTCCTTTCCCAACAGAACTTTTGGACCAACGGGAGAGCGCATTCGTGAAGTTGGGCATGAATACGGGACAACA  
ACAGGGCGTCCGCGTCGAGTTGGTTGGTTTGGTCTCAGTTGTTATGCGTCACAGCCGCCGCGTATCAGGCATTACC  
AATTTATCTCTTAACTGTATTGATGTACTTTCAGGTCTTGATATCGTAAAATCTGTGTAGCCTATGATTTGGAT  
GGAAACGGATTGATCACTACCCTGCCAGTCTCGAACAACCTCAAACGCTGTAAACCTATTTATGAAGAATTGCCG  
GGCTGGTCTGAAGATATTACAGGGGTTCGCAGTTTAGAAGATCTTCTGAAAATGCTCGTAATTATGTCCGCCGT  
GTAAGTGAATTAGTTGGTGTTCGTATTTCTACTTTCTCAGTNGTCCCC

**348 *Streptococcus gordonii* (SEQ ID NO. 348)**

TAATGCTAGCAATTGACCAAGGTACCTATCCATTTGTAACCTCATCTAATCCAGTTGCTGGTGGTGTAAACGATCG  
GTTCTGGTGTGGGTCTAGCAAGATTGACAAAGTAGTGGGTGTTTGTAAAGCCTATACAAGTCGTGTTGGTGATG  
GTCCTTTCCCAACAGAGCTTTTCGATGAAGTAGGTGACCGCATTCGTGAGGTTGGTCATGAGTATGGTACAACAA  
CAGGACGTCCGCGTCGAGTTGGTTGGTTTGGTCTGTTGTTATGCGCCATAGCCGCCGCGTGTATCTGGGATTACCA  
ATCTTTTCGCTTAACTCTATCGATGTTTTGAGCGGTCTGGATACAGTCAAGATCTGTGTAGCCTATGATTTGGATG  
GCCAAAGAATCGACCACTATCCAGCTAGTTTGAACAGCTTAAACGTTGTAAGCCGATTTACGAAGAGCTTCCTG  
GATGGTCTGAAGATATTACTGGCGTTCGTAAGTTAGAAGATCTTCCAGAAAATGCTCGCAACTATGTTCCGCGGAG  
TAAGCGAGTTGGTTGGTGTACGTATTTCCACCTTCTCAGTTGGCCCC

**349 *Bacillus species* (SEQ ID NO. 349)**

TATGGCTTGCAATTGACNCGGTACGTACCCATTCGTTACATCTTCTAACCCGATTGCGGGTGGTGTAAACAGTTGG  
AACTGGAGTTGGTCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTTGGTGACGG  
TCCATTCCCTACTGAACCTAATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTACGGAACAACAAC  
TGGTCGTCCGCGCCGCGTAGGTTGGTTTCGATAGCGTTGTTGTAAGACATGCGCGTCGTGTTAGTGGTTTAAACGGA  
TCTATCATTAAATTCTATCGACGTTTTAACAGATATTCGACTCTTAAAATTTGTGTTGCTTACAAATACAATGG  
CGAAGTTATCGATGAAGTTCCAGCAAACTTAAACATTTTAGCAAAATGTGAGCCTGTATATGAAGAGCTTCAGG

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TTGGACAGAAGATATTACTGGTGTAAAATCATTAGACGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGT  
TTCTGAGTTAACAGGAATTCATTATCTATGTTCTCAGTNGTCCCC

**350 *Bacillus pumilus* (SEQ ID NO. 350)**

GTTATGGCTTGCTATTGATCAAGGGACATATCCATTTGTCACGTCATCTAACCCAGTAGCTGGAGGAGTGACGAT  
TGGTTCTGGCGTAGGACCAACAAAAATTCAACATGTGGTCGGCGTGTCAAAGCGTACACAACACGTGTTGGAGA  
TGGCCCATTTCCCGACAGAACTCCATGATGAAATTGGCGATCAAATCCGTGAGGTTGGCCGTGAATACGGTACAAC  
AACTGGACGTCCGCGCCGTGTTGGCTGGTTTGACAGTGTCTGTTGTCCGTCATGCTCGACGTGTGAGCGGGATTAC  
AGATCTATCTCTTAACCAATTGATGTACTGACAGGGATTGAAACATTGAAAATCTGTGTGCGCTTATAAATTGAA  
CGGAGAAATCACAGAGGAATTCCCAGCAAGTCTAAATGAACTAGCGAAATGTGAGCCTGTCTACGAAGAAATGCC  
AGGATGGACAGAGGATATTACAGGCGTGAAGAATTTAAGCGAACTGCCTGAAAATGCCCGTCATTATTTAGAGCG  
CATTTACAATTAACAGGTATTCCACTTTCCATTTTCTCAGTTGNCCCC

**351 *Enterococcus villorum* (SEQ ID NO. 351)**

TATCGACCAGGGACATATCCATTTGTTACTTCTTCCATCCAGTAGCAGGTGGTGTAAACAATTGGTAGTGGCGTTG  
GTCCATCTAAAATTAATAAAGTCGTGCGAGTATGTAAAGCTTATACTTCTCGTGTGGAGATGGCCCGTTCCCTA  
CAGAATTATTTGATGAAACAGGGCAACAAATACGTGAAGTAGGTCGTGAATATGGCACAACAACAGGTCGTCCAC  
GACGAGTTGGATGGTTTGATACGGTTGTTATGCGCCATTCAAAACGTGTATCAGGTATTACAAATTTATCTCTTA  
ATTCGATTGATGTATTAAGCGGATTAGAAACAGTAAAAATTTGTACGGCCTATGAACTAGATGGTGAGCTGATTT  
ATCATTACCCAGCAAGTTTGAAAGAATTGAAACGTTGTAAACCAGTATATGAAGAACTACCTGGATGGTCTGAAG  
ATATTACGAAATGCAAGACACTTTCTGAATTGCCAGAAAATGCACGTAACCTATGTAAGACGTATTTCTGAGCTTG  
TAGGTGTACGCATCTCCACATTTCTCAGTGGNCCC

**352 *Bacillus thuringensis* (SEQ ID NO. 352)**

CNCGGTACGTACCCGTTTCGTTACATCTTCTAACCCGATTGCGGGTGGTGTAAACAGTTGGAACCTGGAGTTGGCCCT  
GCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTTGGTGACGGTCCATTCCCTACTGAA  
CTTAATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAGTACGGAACAACAACCTGGTCGTCCGCGCCGC  
GTAGGTTGGTTGCATAGCGTTGTTGTAAGACATGCGCGTCGTGTTAGTGGTTTAACGGATCTATCATTAATTTCT  
ATCGACGTTCTAACAGATATTCCAACCTCTTAAAAATTTGTGTTGCTTACAAATACAATGGCGAAGTTATCGATGAA  
GTTCCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATT  
ACTGGTGTAAATCATTAGACGAGCTTCCTGAAAATGCAAGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGA  
ATTCAATTATCTATGTTCTCAGTGGCCCCNNGGGCCCCA

**353 *Bacillus mycoides* (SEQ ID NO. 353)**

GGTNCGTACCCATTTCGTTACATCTTCTAACCCGATTGCTGGTGGTGTAAACAGTTGGAACCTGGAGTTGGTCCCTGCG  
AAAGTTACTCGCGTTGTAGGTGTATGTAAAGCATATACAAGCCGTGTAGGTGATGGTCCGTTCCCTACTGAGCTT  
CATGATGAAATTGGTCATCAAATTCGTGAAGTTGGTCGTGAATACGGAACAACAACCTGGTCGTCCACGCCGCGTA  
GGTTGGTTGCATAGCGTTGTTGTAAGACATGCACGTCGTGTTAGTGGTTTAACAGATCTATCATTAATTTCTATC  
GACGTTCTAACAGGTATTCCAACCTCTTAAAAATTTGTGTTGCTTACAAATACAATGGCGAAGTTATCGATGAAGTT  
CCAGCAAACCTTAAACATTTTAGCGAAATGTGAGCCTGTATATGAAGAGCTTCCAGGTTGGACAGAAGATATTACT

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GGTGTAAGAGCATTAGACGAGCTTCCTGAAAATGCACGAAAATACGTAGAACGTGTTTCTGAGTTAACAGGAATT  
CAATTATCTATGTTCTCAGTGGNCCCCCGG

**354 *Bacillus weihennstephanensis* (SEQ ID NO. 354)**

TTTTTTTNGGAAGNGCGCAAGGTGTTATGCTTGATATCGACCACGGTACGTACCCGTTTCGTTACATCTTCTAACC  
CAATTGCTGGTGGTGTAAACAGTTGGAAGTGGGCTGCGAAAGTTACTCGCGTTGTAGGTGTATGTAAAG  
CATATACAAGCCGTGTTGGTGATGGTCCATTCCCTACTGAACTTAATGATGAAATCGGTACCAAATTCGTGAAG  
TTGGTCGTGAATACGGAACAACAACGGGTCGTCCACGCCGTGTAGGTTGGTTCGATAGCGTTGTTGTAAGACATG  
CACGTCGTGTTAGTGGTTTAAACAGATTTATCATTAACTCTATCGATGTATTAACAGGTATTCCAACGTGTTAAAA  
TTTGTGTTGCTTACAAATGCAATGGCGAAGTTATCGATGAAGTTCCAGCTAACTTAAACATTTTAGCGAAATGTG  
AGCCTGTATATGAAGAGCTTCCNGGTTGGACAGAAGATGTTACTGCTGTGAAATCATTGGATGAGCTTCCTGAAA  
ATGCAAGAAAATACGTAGAGCGTGTTCCTGAATTAACNGGAAGCCAATTNNCAAG

**355 *Staphylococcus haemolyticus* (SEQ ID NO. 355)**

CAAGGTGTCATGTTAGATATCGACCATGGTACATATCCTTTCGTAACCTCAAGTAACCCTGTTGCAGGTAATGTA  
ACAGTTGGTACAGGTGTAGGCCCAACTTTCGTATCTAAAGTGATTGGTGTATGTAAAGCATATACATCTCGTGTA  
GGCGATGGTCCATTCCCTACAGAATTATTTGATGAAAATGGACATCATATTAGAGAAGTTGGTCGTGAATACGGT  
ACAACAACAGGACGTCCACGTGCTGAGGTTGGTTTGACTCAGTTGTATTACGTCACTCTCGTCGTGTTAGTGGT  
ATTACAGACTTATCTATTAACCTCTATCGACGTACTTACAGGTCTTGATACAGTGAAGATTTGTACTGCTTACGAA  
TTAGATGGAGAAGAAATTACAGAATATCCTGCTAACTTAGATCAATTACGTCGTTGTAAACCAATCTTTGAAGAG  
TTACCAGGATGGGAAGAAGATATCACTGGTTGCCGTACATTAGAAGAATTACCAGATAACGCACGTAAATACTTA  
GAACGCATTTCTGAATTATGTAATGTACGTATTTCAATCTTCTCAGT

**356 *Staphylococcus saprophyticus* (SEQ ID NO. 356)**

GCAAGGTGTGATGTTAGATATCGACCATGGTACATATCCATTTCGTTTCATCAAGTAACCCAGTTGCAGGTAATGTG  
ACTGTCGGTGGCGGTGTAGGTCCAACATTTCGTCTCTAAAGTTATCGGTGTGTGTAAAGCCTATACATCACGTGTC  
GGCGATGGTCCATTCCCAACAGAACTATTTGACGAAGATGGGCACCACATCCGTGAAGTAGGTCGTGAATACGGT  
ACAACAACAGGACGTCCACGTGCTGAGGTTGGTTGCACTCAGTTGTATTACGTCACTTCTCGTCGTGCAAGTGGT  
ATTACAGATTTATCTATTAACCTCAATTGATGTATTAACAGGCCTTAAAGAAGTTAAAATCTGTACTGCTTATGAG  
TTAGACGGTAAAGAAATTACGGAATACCCAGCTAACTTGAAAGACTTACAACGTTGTAAGCCAATTTTTGAAACA  
TTACCAGGTTGGACAGAAGATGTGACAGGTTGTCGTTTATTAGAAGAATTACCTAATAATGCGCGTAGATACTTA  
GAACGTATTTCTGAATTATGTGACGTGAAGATTTCAATCTTCTCAGTTGGCCC

**357 *Bacillus subtilis* (SEQ ID NO. 357)**

CTCAAGGGGTATGCTTGATATTGACCAAGGGACATACCCGTTTGTCACTTCATCCAACCCGGTCGCCGGAGGGG  
TGACGATCGGTTTCAGGCGTAGGCCCCGACAAAATCCAGCACGTTCGTCGGTGTATCTAAAGCGTACACAACCCGTG  
TCGGTGACGGTCCTTTCCCGACTGAGCTGAAAGATGAAACCGGGGATCAAATCCGTGAAGTCGGACGCGAATACG  
GCACAACGACAGGCCGTCCGCGCCGTGTCGGCTGGTTTGACAGCGTTGTTGTCCGCCATGCCCGCCGCGTCAGCG  
GAATCACAGATCTTTCTCTGAACTCAATCGATGTGCTGACTGGCATTGAAACATTGAAAATCTGTGTGCTTACC  
GCTACAAAGGTGAAGTGATTGAAGAATTCGCCGCAAGTCTGAAAGCTCTCGCAGAGTGTGAACCGGTATATGAAG

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AAATGCCTGGCTGGACGGAAGATATCACAGGCGCAAAAACATTAAGCGATCTTCCTGAAAATGCGCGCCATTATC  
TGGAACGCGTGTCTCANCTGACAGGTATTCCGCTTTCTATTTTCTCAGTAGGTCCAGA

**358    *Listeria monocytogenes* (SEQ ID NO. 358)**

TTTGGAAGGGGCGCAAGGGGTATGCTTGATATTGATCAAGGAACATATCCATTTGTAACCTCAAGTAACCCGAT  
TGCTGGTGGCGTAACTATCGGTAGTGGTGTGGTCCTTCAAAAATCAATCATGTTGTTGGTGTGGCGAAAGCTTA  
TACAACACGTGTTGGTGATGGTCCTTTCCCAACAGAATTATTTGATTCTATTGGTGACACTATTCGTGAAGTCGG  
TCATGAATATGGTACAACGACTGGTCGTCGCGTCGTGTAGGTTGGTTTGATAGCGTAGTGGTTCGTCATGCGCG  
TCGTGTTAGTGGATTAACAGATTTATCGTTAACACTACTTGATGTTTTGACAGGAATTGAGACACTTAAAATCTG  
TGTAGCTTACAAATTAGACGGAAAAACAATTACAGAGTTCCAGCAAGTTTGAAAGATTTAGCTCGTTGCGAACC  
TGTTTATGAAGAACTTCCAGGCTGGACGGAAGATATTACTGGAGTTACATCACTAGATGATCTTCCAGTGAAGTG  
CCGCCATTACATGGAGCGTATCGCCCACTTACGGGAGTGCAAGTTTCTATGTTCTCAGTAGGTCCCAGACCA

**359    *Lactococcus lactis* (SEQ ID NO. 359)**

TNATGCTTGATATTGACNAGGAACATACCCATTTGTAACCTCTCAAACCCAGTAGCTGGTGGGGTAACGATTGGC  
TCTGGTGTGGGTCCATCAAAAATTTCAAAGTTGTTGGTGTGTTGTAAAGCCTATACTTCACGTGTGGGTGATGGT  
CCATTCCCAACAGAACTTTTTGATGAAGTTGGACATCAAATTCGTGAAGTAGGACATGAATATGGAACAACAACA  
GGACGTCCACGTCGTGTTGGTTGGTTTGACTCAGTCGTAATGCGTCATGCAAACGTGTTTCTGGCTTGACAAAT  
CTTAGCTTGAATTCAATTGACGTTCTCTCAGGACTTGAAACAGTAAAAATTTGTGTTGCTTACGAACGTAGTAAT  
GGTGAACAAATTACTCATTATCCAGCATCACTTAAGGAATTAGCAGATTGCAAACCAATCTATGAAGAAATTGCCA  
GGATGGTCTGAAGATATTACTTCATGCCGAACTTTAGAAGAGTTACCAGAAGCTGCTCGTAACTATGTTTCGTCGG  
GTTGGTGAAC TAGTTGGCGTACGTATCTCGACTTTCTCAGTNGTCCCC

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**Figure 15 represents marker II (pstI) sequences amplified from Gram-positive bacteria (SEQ ID NOs: 360-395; SEQ ID NOs: 397-399), and some Gram-negative bacteria (SEQ ID NOs 396, 400-403).**

**SEQ ID NO. 360      *Bacillus anthracis***

ACCNNTTTTACAGACGTAAAATAGATAGGTTATATGGTTGGTATAAGTAAGATACTTGTTTCGTTTCATACGGTCTG  
CAGCCATTGTGTATTGAATTAAGTCATTTGTTCCGATAGAGAAGAAATCAACTTCTTTTGC GAATTGATCTGCTA  
ATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATCAGAAACAGTTGTACCCACTTCTACAA  
GTTTCGCTTTTTTCTTCTAATAAGATCGCTTTTGCTTGACGGAACATCAAGAGTTGCAATCATTGGGAACATAA  
TTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGAACACATCTTGCTCATCAAGAC  
ATAAGCGAATTGCACGGTAGCCCAAGAACGGNTTCATTCTCTTA

**SEQ ID NO. 361      *Bacillus cereus***

GCCTTCTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTA  
TGATACTTGTTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTGTTCCGATAGAGAAGAAGTC  
AACTTCTTTCGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATC  
AGAAACAGTTGTACCCGCTTCTACAAGTTTCGCTTTCTCTTCTAATAAAATCGCTTTTCGCTTGACGGAACATC  
AAGAGTTGCAATCATTGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGT  
ACGGAACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCATTCTCGTTA

**SEQ ID NO. 362      *Listeria monocytogenes***

GCCCTCTTTATGAGAAGCATCAATTACCATTTTTACTAAACGTAAGATGGATGGATTGTATGGTTGGTAAAGGTA  
AGAAACCGGTTTCGTTTCATACGGTCCGCAGCCATTGTATACTGAATTAAGTCATTTGTTCCGATAGAGAAGAAATC  
AACTTCTTTTGCAAATTGATCAGCAAGAACTGCAGCGGCAGGAATTTCAATCATAATTCCAAGTTTCGATGGAATC  
AGATACTTCTGTTCCAGCAGCTTTTAGTTTTGCTTTCTCATCTAGTAAAATATCACGTGCTTGACGGAATTCATT  
TACTGTTGCAATCATCGGGAACATAATTTTTAAGTTACCATATACACTTGCGCGAAGTAAGGCGCGAAGTTGCGT  
ACGGAATAATTCTTCATTTCGCAAAACAAAGACGAATTGCGCGGAATCCCAAGAACGGATCNTTCTCCTTA

**SEQ ID NO. 363      *Streptococcus pneumoniae***

CGCGTGAGCTGCTTTGATCCATTGTTAATCAAGCGTAGGATTGATGGGTTGTATGGTTGGTAAAGGTATGAACT  
TGTTTCGTTTCATACGGTCTGCTGCCATTGTATATTGGATCAAGTCATTTGTACCAATTGAGAAGAAGTCAACTTCT  
TTAGCAAATTGGTCTGCAAGCATAGCCGCTGCAGGAATCTCGATCATGATACCAACTTGAATGTTATCCGCAACT  
GCAACACCTTCAGCAAGAAGGTTTGCTTTTTCTTCATCAAAGACTGCTTTTCGCTGCACGGAATTCTTTCAAGAGC  
GCAACCATTGGGAACATGATACGCAATTGACCGTGAACAGACGCACGAAGAAGAGCACGGATTTGTGTGCGGAAC  
ATAGCATCTCCAGTCTCAGAGATAGAGATACGAAGAGCACGGAATCCNANGAACGGATCCTTTTTTCNTA

**SEQ ID NO. 364      *Streptococcus pyogenes***

TGCGCTGCTTTGATACATTGTTGATCAAACGTAATATTGATGGGTTGTATGGTTGGTAAAGGTATGATACTTGTT  
CGTTCATACGGTCTGCTGCCATAGTGATTGGATAAGGTCGTTTGTTC AATTGAGAAGAAATCAACTTCCTTAG

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CAAATTGGTCTGCAAGCATAGCAGCTGCAGGAATCTCAATCATGATACCAACTTGGATGTCATCAGCAACCGCAA  
CGCCTTCTGCAAGCAAGTTTGCTTTTTCTTCGTCAAAGACTGCTTTTGCAGCACGGAATTCTTTAAGAAGCGCAA  
CCATTGGGAACATAATACGAAGTTGTCCGTGAACAGAGGCACGAAGAAGCGCACGCATTTGTGTGCGGAACATGG  
CATCCCCAGTTTCAGAGATGGAATACGAAGAGCACGGAAACCNAAGAACGGATCNTTTTTNCCNTA

**SEQ ID NO. 365     *Streptococcus agalactiae***

GAGCAGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGATTGTATGGTTGATAGAGGTATGAACTTGCT  
CATTCATACGGTCCGCAGCCATTGTGTATTGGATAAGATCATTAGTACCAATTGAGAAGAAATCAACTTCTTTTG  
CAAATTGGTCTGCAAGCATAGCTGCCGCTGGGATTTCAATCATAATACCAACTTCAATGCCTTCAGCTACTGCTA  
CACCGTCAGCTAACAAGTTGCTTTCTCTTCTTCAATATAGCTTTAGCAGCACGGAATTCTTTAAGCAAAGCAA  
CCATTGGGAACATGATGCGTAGCTGTCCATGAAGTGAAGCACGAAGAAGTGCTCGGATTTGTGTGCGGAACATTG  
CATCACCAGTTTCAGAAATTGAAATACGCAATGCACGGAATCCCAAGAACGGATCNTTTTTTCNTA

**SEQ ID NO. 366     *Streptococcus mutans***

TGAGCAGCCTTAACCCATGATCAACCAAGCGAAGAATGGATGGATTATAAGGTTGGTAGAGGTATGATACTTGTT  
CATTCATACGGTCAGCAGCCATGGTGTATTGAATAAGGTCATTTGTACCGATTGAGAAGAAATCAACTTCCTTAG  
CAAATTGGTCAGCCAACATTGCAGCTGCAGGAATTTCAATCATGATACCAACTTGGATATCATCTGAAACAGCAA  
CGCCTTCAGCTTTAAGATTAGCCTTTTCTTCTTCCAGAATACCTTTAGCTTTACGGAACTCATTGAGCAAAGCTA  
CCATTGGGAACATGATACGCAACTGACCATGAACAGAAGCACGCAAAAGGGCACGCAACTGTGTGCGGAACATCT  
GATTGCCTGTTTCTGAGATTGAAATACGAAGTGCACGAAAACCAAAGAACGGATCATTCTCTTA

**SEQ ID NO. 367     *Enterococcus flavescens***

CGTCGTGTGCTGCATCAATTACATTTTTAATTAAACGTAAGATTGATGGGTTGTATGGTTGGTATAAGTAAGAAA  
CGCGTTCGTTTCATACGGTCTGCCGCCATTGTGTATTGGATTAAGTCGTTGGTTCCAACACTAAAGAAGTCTACTT  
CTTTGGCAAATTTATCAGCTAATACGGCAGCTGCTGGAATTTCAATCATAATACCTACTTGGATATCGTTTTGAAA  
CTTCAACACCTTCGTTGACTAATTTTTGTTTTTCGTCTTCAAAGATTGCTTTTCGTGCTCTAAATTCTTTCAAAG  
TAGCAACCATTTGGGAACATGATACGTAAGTTACCATGAACAGACGCACGTAATAATGCACGCATTTGTGTACGGA  
ACATGCCGTCACCTAGTTCTGATAAGCTAATACGTAATGCACGGTAACCCAAGAACGGATNATTCTCGTA

**SEQ ID NO. 368     *Staphylococcus aureus***

NNCCNTCTTATGTGACGCTTCAATAACTTGTTTAACTAAACGTAAGATTGAAGGGTTATATGGTTGGTATAGAT  
ATGATACACGCTCTGACATACGGTCAGCAGCTAATGTGTATTGAATTAAATCATTTGTACCGATACTGAAGAAAT  
CTACTTCTTTAGCAAAGACATCAGCTAATGCTGCTGTTGCAGGTATCTCTACCATGATTCTAATTCTATATCAT  
CCGAAATGTCATGACCTTCATTTTTAAGGTTTTCTTTTTCTTCTAATAATATAGCTTTTGCTTCTCTAAATTTCGT  
TAATTGTTGCAACCATTTGGGAACATGATATTTAACTTACCATAAACTGATGCACGTAATAATGCACGTAGCTGTG  
GTCTGAAAATATCTTGTTGCGCAAGGCATAAACGAATCGCACGGTAACCCAAGAACGGATCCNTTNTCCTTAA

**SEQ ID NO. 369     *Staphylococcus epidermidis***

CTTCTTTATGAGAAGCTTCAATAACTTGTTTAACTAATCGTAAAATTGAAGGATTATATGGTTGATATAAGTATG  
AAACTCGTTTCAGACATACGGTCAGCAGCTAATGTGTATTGAATTAAGTCATTGTTTCTATACTAAAGAAATCTA



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CTTCTTTAGCAAATACATCAGCAAGTGCCGCGGTAGCTGGAATTTCAACCATAATACCTAATTCAATATCATCTG  
AAACTTCGTAACCTTCGCGAAGAAGATTTTCTTTCTCTTCAAGAAGCATTGATTTAGCGTCACGGAATTCCTTAA  
TTGTTGCTACCATTTGGGAACATAATATTCAATTTCCCATAGACTGAAGCACGTAGTAATGCACGTAATTGTGGTC  
TAAAGATTTCCGGCTGTGCTAAACATAAACGTATCGCACGATAACCCAAGAACGGATCNTTCTNCGTA

**SEQ ID NO. 370     *Bacillus thuringensis***

CTTTATGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTATGATA  
CTTGTTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTCGTTCCGATAGAGAAGAAATCAACTT  
CTTTCGCGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATCAGAAA  
CAGTTGTACCCGCTTCTACAAGTTTCGCTTTCTCTTAATAAAATCGCTTTTCGCTTGACGGAACATCAAGAG  
TTGCAATCATTTGGGAACATAATTTTTAAGTTGCCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGA  
ACACATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCATTCTCNTTA

**SEQ ID NO. 371     *Staphylococcus hominis***

CNCCNNCCTTATGAGGAAGCTTCAATAACCTGTTTAACTAAACGTAAAATTGCTGGATTATATGGTTGATATAAA  
TATGAAACACGTTTCAGACATACGATCAGCTGCCATAGTATATTGAATTAAGTCATTAGTTCCTATACTAAAGAAA  
TCTACTTCTTTAGCAAAGATATCAGCTAACGCAGCAGTAGAAGGAATCTCTACCATGATACCTACTTCGATATCA  
TCAGCAACTTCTTGTCCTTCGCTAGTTAATTTATCTTTTTCTTCTAAAGAATAGCTTTAGCATCTCTAAACTCT  
TTAATAGTAGCTACCATTTGGGAACATAATATTTAATTTACCATAAGCAGATGCGCGTAATAACGCACGTAATTGT  
GTTCTGAAGATGTCTTGTTGATCTAAGCACAAACGAATTGCACGATAACCCANGAACGGATTCATNTCNTA

**SEQ ID NO. 372     *Enterococcus faecium***

CGCGTGTGCTGCATCAATTACATTTTTGATCAAACGTAAAATTGATGGGTTATATGGTTGGTACAAGTAAGAAAC  
GCGTTTCGTTTCATACGGTCTGCTGCCATTGTGTATTGAATCAAATCGTTTCGTACCTACAGAGAAGAAATCTACTTC  
TTTTGCAAACCTTGCTGCTAAGACTGCTGCTGCTGGAATCTCGATCATGATGCCGACTTGGATCGTATCAGATAC  
TTCCTTGCCCTTCACTGATCAATTTTTGTTTTTCTTCTTCAAAGATCGCTTTTGCTGCGCGGAATTCTTTGAGTGT  
AGCTACCATAGGGAACATGATACGTAAGTTACCATGAACAGATGCACGAAGCAATGCACGCATTTGTGTACGGAA  
CATTTTCGTCGCCCTTGTTTCAGATAAACTGATACGCAATGCACGATATCCCAAGAACGGATCATTCTCCTTA

**SEQ ID NO. 373     *Clostridium perfringens***

CNTGTTTGTGAGCTCCATCTATTGTCATTTTGATTAATCTTAATACAGCTGGATGCATTGGATTGTAAAGGTATG  
ATACCTTTTCACTCATTCTGTCAGCAGCTAATGTATATTGTATTAAATCGTTAGTTCCTATTGAGAAGAAATCAA  
CATGCTTAGCTAATTCATCAGCATAAACTGCTGCAGCTGGGATTTCAACCATGATACCCCATTTGAATTGAATCTG  
AGTATGCTATACCTTCTGCTTTTAACTCAGCTTTGCATTCTTCAACAAATGCTTTAGCTTGTTGGAATTCTTCTA  
ATCCTGAAATCATTGGGAACATTACTGCAAGATTTCCATAAACAGAAGCTCTTAATAAAGCTCTTATTTGAACTC  
TAAAGATATCTTTTCTGTCTAAGCATAATCTTATAGCTCTGTATCCCAAGAACGGATCNNTNNTCNTTAA

**SEQ ID NO. 374     *Bacillus mycoides***

CTTTATGAGCAGCATCGATCACCATTTTTACAAGACGTAAAATTGATGGGTTATATGGTTGGTATAAGTAAGATA  
CACGTTTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTTGTTCCGATAGAGAAGAAATCGACTT

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CTTTTGCGAATTGATCTGCTAATACTGCTGAAGCTGGAATTTCAACCATCATACCAACTTCAATAGAATCAGAAA  
CAGTTGTACCCGCTTGGACAAGTCTTTCTTTCTTTCTAATAAAATCGCTTTCGCTTGACGGAATTCATCAAGAG  
TTGCAATCATCGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGA  
ACACATCTTGTCTTCAAGGCATAAGCGAATTGCACGGTATCCCAAGAACGGATCNTTCTCNTTA

**SEQ ID NO. 375     *Streptococcus oralis***

CNNTTTCCTTCGCGTGAGCTGCTTTGATAACGTTGTTGATCAGCGTAGGATTGATGGGTTGTATGGTTGGTAAA  
GGTATGAACTTGCTCGTTCATACGGTCTGCTGCCATTGTGTATTGGATCAAGTCGTTTGTACCAATTGAGAAGA  
AGTCAACTTCTTTAGCAAATTGGTCTGCAAGCATTGCTGCTGCAGGAATTTTCGATCATGATACCAACTTGGATAT  
TATCCGCAACTGCAACACCTTCAGCAAGAAGGTTTGCTTTTTCTTCGTCAAAGACTGCTTTCGCTGCACGGAATT  
CTTTCAAGAGCGCAACCATTTGGGAACATGATACGTAATTGACCGTGAACAGACGCACGAAGAAGAGCACGGATTT  
GTGTGCGGAACATAGCATCTCCAGTCTCAGAGATAGAGATACGAAGAGCACGGAATCCNAAGAACGGATCNTTTC  
TCTTA

**SEQ ID NO. 376     *Enterococcus hirae***

CNATTTACCTTCGCATGCGCTGCATCGATCACGTTTTTAATCAAACGTAGGATTGATGGGTTGTAAGGTTGATAC  
AAGTATGAAACACGTTTCGTTTCATACGGTCAGCTGCCATAGTGTATTGGATCAAGTCATTCGTTCTACTGAGAAG  
AAGTCAACTTCCTTAGCAAACCTTGTCAGCTAAGACAGCTGCTGCTGGAATTTTCGATCATGATGCCGACTTGGATC  
GTATCAGATACTTCCACGCCTTCATTCAATAATTTTTGTTTTCTTCGTCTTCAAAGATTGCTTTTGCAGCACGGAAT  
TCTTTAAGAGTCGCTACCATTTGGGAACATGATACGTAAGTTTCCATGAACAGATGCACGTAATAATGCGCGCATT  
TGCGTACGGAACATTTTCGTACCTTGTCTGACAAGCTGATTGCGTAATGCACGATAGCCCAAGAACGGATCNTTN  
TCCTTA

**SEQ ID NO. 377     *Enterococcus avium***

CNATTTNCCTTCGCGTGCGCTGCATCAATCACGTTTTTGATTAAGCGTAGAATTGATGGGTTATATGGTTGGTAA  
AGGTAAGAAACGCGTTTCGTTTCATACGGTCAGCTGCCATCGTGTATTGAATTAAGTCATTTGTTCCGATACTGAAG  
AAATCAACTTCCTTTGGCAAACCTTGTCAGCTAGTACAGCTGCAGCTGGAATTTTCGATCATGATTCCGACTTGGATC  
GTATCAGAACTTCCACGCCTTCTTTAACCAATTTTTCTTTTTCTTCGTTGAACATTTTCTTCGCTGCACGGAAT  
TCTTTTAATGTGCAACCATTTGGGAACATGATGCGTAAGTTACCATGAACAGAAGCGCGCAACAATGCACGTAAT  
TGTGTACGGAACATGTCATCGCCTAGTTCGGATAGACTAATACGCAATGCACGATAACCCAAGAACGGATCNTTT  
TTCTTAA

**SEQ ID NO. 378     *Staphylococcus saprophyticus***

TCGTAAGAAGCTTCTATTACTTGTTTTACTAAACGTAATATTGAAGGATTATATGGTTGATACAAGTAAGAAACA  
CGTTCTGACATTCTATCAGCAGCCATTGTATATTGAATTAATCATTCGTTCTTACTGAAGAAATCAACTTCT  
TTAGCAAATACATCTGCCAACGCAGCAGTAGAAGGAATTTCTACCATAATACCAAGTTTCGATATCATCAGAACT  
TCAATGCCTTCATTTGTTAAGTTATCTTTTTCTTCAAGTAACAATGCTTTAGCATCACGGAACCTTTGGATTGTA  
GCTACCATAGGGAACATGATATTCAATTTACCAAAAAGCAGATGCACGTAATAATGCACGCAACTGTGGTCTGAAA  
ATATCAGGTTGATCTAGGCATAAACGGATAGCACGGTAACCCAAGAACGGATCATTCTCTTA

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**SEQ ID NO. 379     *Staphylococcus haemolyticus***

GAAGCTTCATGACTTGTTTAACCAAGCGTAAAATAGCTGGGTATAAGGTTGGTATAAGTATGAAACGCGTTCTG  
ACATACGGTCAGCTGCCATAGTATATTGAATTAAATCATTAGTACCAATACTGAAGAAATCCATTTCTTTAGCAA  
AGATATCAGCTAAAGCAGCTGTAGATGGAATCTCAACCATGATACCTAACTCAATTTTCATCAGAAACGTCATGAC  
CATCATTTTTTAAGATTTTCTTTTCTTCTAACAGAATGGCTTTAGCATCACGGAATTCATTGATTGTAGCTACCA  
TTGGGAACATAATGTTTAATTTACCGTAAGCTGACGCGCGTAATAATGCACGTAATTGTGTTCTGAAAATATCTT  
GTTGATCTAAGCATAGACGAATTGCTCTGTAACCCAAGAACGGNTCNTTCTCTTA

**SEQ ID NO. 380     *Enterococcus flavescens***

NGCATGCGCTGAGTCGATCACGTTTTTGATCAAACGTAAAATTGATGGGTGTATGGTTGGTACAAGTAAGACAC  
GCGCTCGTTTCATGCGGTCTGCAGCCATTGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCAACTTC  
CTTCGCAAACCTTGCTCTGCTAAGACAGCAGCTGCTGGAATTTTCGATCATGATTCCGACTTGGATCTCGTTAGAAAC  
CTCAACGCCTTCGTCAATCAATTTTTGACGCTCTTCTTCATACATTTTCTTCGCAGTACGGAACCTTTTCAATGT  
TGCCACCATTGGGAACATGATACGTAAGTTGCCGTGAGCAGAAGCACGTAACAACGCACGAAGTTGGGTACGGAA  
CATGTCATCCCCAAGTTCAGATAAGCTGATACGCAATGCACGATAGCCCAAGAACGGATATTNNTCNTA

**SEQ ID NO. 381     *Enterococcus casseliflavus***

GCGCTGAGTCGATACGTTTTTTGATCAAACGTAAAATTGATGGGTGTATGGTTGGTACAAGTAAGACACGCGCTC  
GTTTCATGCGGTCTGCAGCCATGGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCAACTTCCTTCGC  
AACTTGTCTGCTAAGACAGCAGCTGCTGGAATTTTCGATCATGATTCCGACTTGGATCTCGTTAGAAACCTCAAC  
GCCTTCGTCAATCAATTTTTGACGCTCTTCTTCATACATTTTCTTCGCAGTACGGAACCTTTTCAATGTTGCCAC  
CATTGGGAACATGATACGTAAGTTGCCGTGAGCAGAAGCACGTAACAACGCACGAAGTTGGGTACGGAACATGTC  
ATCCCCAAGTTCAGATAAGCTGATACGCAATGCACGATAGCCCAAGAACGGATNATTTNTCTTA

**SEQ ID NO. 382     *Enterococcus gallinarum***

ACCTTNGCATGTGCTGAATCGATTACGTTTTTTGATCAACGTAGAATAGATGGGTATATGGTTGGTAAAGATATG  
AACTTGTTTCATTACATACGGTCTGCAGCCATTGTGTATTGGATCAAGTCATTGGTACCAATACTGAAGAAGTCTA  
CTTCCTTGGCAAATTTGTCTAGCTAAGACAGCTGCTGCAGGAATTTTCGATCATGATACCTACTTGAATATCTTCAG  
AGACGGTTACGCCTTCATCGATCAATTTTTGACGTTCTTCTTCGTACATTTTTTTTCGCAGCACGGAACCTTTTCA  
ATGTTGCCACCATTGGGAACATAATCCGCAAGTTCCGTGAGCAGAAGCACGTAACAGCGCACGAAGTTGTGTAC  
GGAACATGCCGTACCCAACTCAGACAACTGATACGCAATGCACGATAGCCCAAGAACGGATCTTTNTCCNTTA

**SEQ ID NO. 383     *Enterococcus raffinosus***

NTGTGCTGCATCAATGACGTTTTTAATCAAACGTAAAGATTGATGGGTATATGGTTGATACAGGTATGAAACGCG  
TTCGTTTCATACGGTCAGCAGCCATTGTGTATTGAATCAAGTCGTTTGTTCGGATACTAAAGAAGTCAACTTCTTT  
TGCAAACCTGTCTAGCTAGAACAGCTGCGGCAGGGATCTCGATCATGATTCCGACTTGAATCGTATCAGAAACCTT  
CACGCCTTCGTTAACAAGCTTTTCTTTTCTTCGTTGAACATTTTCTTCGCTGCACGGAACCTTTTTAATGTTGC  
AACCATTGGGAACATGATGCGTAAATTGCCATGAACTGAAGCGCGTAACAATGCACGTAAGTGTGTACGGAACAT  
ATCGTCGCCTAATTCAGATAAACTGATACGCAATGCACGATAACCCAAGAACGGATNNTTCTNCGTAA

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**SEQ ID NO. 384     *Enterococcus villorum***

GGNCTCTCGTCGTNAGCTGCATCAATCACGTTTTTGATTAAACGTAAAATTGATGGGTTATAAGGTTGGTATAAG  
TATGAAACGCGTTCGTTTCATACGGTCAGCTGCCATAGTGTATTGAATCAAATCATTTGTTCCCTACTGAGAAGAAG  
TCAACTTCCTTCGCAAACTTGTCTAGCTAAAACAGCAGCTGCAGGAATTTCAATCATAATGCCGACTTGGATCGTA  
TCAGATACTTCCACGCCTTCATTCAATAACTTTTTGTTTTTCATCTTCAAAGATTGCTTTTGCCCCACGGAATTCT  
TTAAGTGTGCGCCACCATTTGGGAACATGATACGTAAGTTACCGTGAACGGATGCACGCAATAACGCACGCATTTGT  
GTACGGAACATTTTCGTCTCCTTGTTCAGAAAGACTGATACGTAATGCACGATATCCNANGAACGGNTTATTTTTTC  
NTA

**SEQ ID NO. 385     *Clostridium difficile***

TTTNNGGANGGCNTCTNTCGTANGCATTGTCTATANCAGTCTTTATAAGTCTTAAACAGCTGGATNAAATTGAT  
TGTAAGNTAACTTATCTTTTGATTCATTCTATCAACTGCACAAGTGTATTGAATTAAATCATTAGTTCCCTATAG  
AGAAGAAATCTACGTGTTTAGCCAATACATCAGATATCACAGCAGCAGATGGAACCTTCTATCATCATACCAATTT  
CTACATCTTTAGCATAAGCCACACCTTCAGAATCAAGTCTGCTAAAACCTTCTTTTACAACTTCTTTAGCTTGTA  
ACAACTCTTCTAAAGATGAAATCATTTGGGAACATGATTCTTAATCTTCCATGAACACTAGCTCTATATAAAGCTC  
TCAATTGAGTCTTAAATATATCTTTTCTATCTAGGCAAAGTCTTATTGCTCTGTAACCCAAGAACGG

**SEQ ID NO. 386     *Streptococcus mitis***

NGCGTGAGCTGCCTTGATAACGTTGTTGATCAAGCGAAGGATTGATGGGTTATATGGTTGGTAAAGGTATGAAAC  
TTGCTCGTTTCATACGGTCTGCTGCCATTGAGTATTGGATCAAGTCGTTTGTTCGAATTGACATGAAGTCTACTTC  
TTTTGCAAATTGGTCTGCAAGCATCGCTGCTGCAGGGATTTCAATCATGATACCAACTTGGATATCATCCGCAAC  
TGCAACACCTTCAGCAAGAAGGTTTGCCTTTTCTTCTTCATAAACTGCTTTGGCTGCACGGAATTCTTTCAAAAG  
AGCAACCATTTGGGAACATGATACGCAATTGACCATGAACAGAAGCACGAAGAAGAGCACGGATTTGTGTACGGAA  
CATTCATCTCCAGTTTCAGAAATAGAGATACGAAGGGCACGGAATCCNAAGAACGGATATTTTTTCNTA

**SEQ ID NO. 387     *Bacillus halodurans***

NCCTTCGCTATGAGCTGCTTTAATAACCATATCGACGAGGCGTAAAATCGCAGGGTGGTATGGCTGATACAGGTA  
GGAGACTCGCTCATTTCATGCGGTCTGAGCCATCGTATATTGAATTAAGTCGTTTCGTTCCGATACTGAAAAAGTC  
TACTTCTTTTGCAAAAAGATTAGCCGCTACCGCCGTCGATGGGATTTCTACCATGATTCCCACTTCAATTGAATC  
GGATACGTCCACTCCTTCACTAAGAAGCTTGTCTTTTTCTCTTGCATGATCGCTTTTGCTTGGCGAAGCTCTTC  
AAGGGTGGCGATCATTGGAAACATCACCTTTAAGTTACCGTATGTGCTTGCGCGAAGCAAGGCACGGAGTTGGGT  
CCGGAAAATATCTTGTTTTTCAAGGCACAGACGAATCGCCCGGAAACCNAAGAACGGATNNTTNTTCNTAA

**SEQ ID NO. 388     *Bacillus weihenstephanensis***

NTGAGCAGCATCGATAACCATTTTTACAAGACGTAAAATAGATGGGTTATATGGTTGGTATAAGTAAGCTACTTG  
TTCGTTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAGTCATTTGTTCCAATAGAGAAGAAATCAACTTCTTT  
TGCGAACTGATCAGCTAATACTGCTGAAGCTGGAATTTCAACCATCATACCAACTTCAATAGAATCAGAAACAGT  
TGTACCCGCTTTAACAAGTCTTTCTTTCTTCTAATAAGATTGCTTTGCTTGACGGAACCTCATCAAGAGTTGC  
AATCATTTGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGAACAC  
ATCTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCNTTCTCNTTA

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**SEQ ID NO. 389     *Streptococcus species***

CNNANTTNCCTTCGCGTGAGCTGCTTTGATAACGTTGTTAATCAACGAAGGATTGATGGGTTGTATGGTTGGTAA  
AGGTATGAAACTTGTTTCGTTTCATACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTTGTTCGATTGAGAAG  
AAGTCAACTTCTTTTCGCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTGGATA  
TCATCTGAAACGGCAACACCTTCAGCTTTAAGGTTTGCTTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAAT  
TCTTTAAGAAGAGCAACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATT  
TGTGTACGGAACATTGCATTTCTGTTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGATCCTTT  
TTCCTTAA

**SEQ ID NO. 390     *Streptococcus gordonii***

NTGCCTTCGCATGAGCCGCTTGATAACATTGTTGATCAAGCGAAGGATAGATGGGTTATAAGGTTGATAGAGGT  
AAGAGACTTGTTTCATTTCATCCGGTCAGCTGCCATAGTGTACTGGATCAAGTCGTTGGTACCAATTGAGAAGAAGT  
CAACTTCCTTGGCAAATTGATCCGCCAACATAGCTGCTGCTGGAATTTCAATCATGATACCCACTTGAATGTTAT  
CCGCTACAGCAACACCTTCAGCTTGCAATTTTCGCTTTTTCTTCTTCGTAAACTGCTTTAGCCTTACGGAATTCTG  
TTAGAAGGGCTACCATTGGGAACATGATACGTAATTGTCCATGTACAGACGCACGTAAGAGAGCGCGGATTGTG  
TACGGAACATAGCATTACCAGTTTCAGAGATAGAGATACGCAAAGCACGGAAGCCNAAGAACGGTCNTTTTT

**SEQ ID NO. 391     *Streptococcus canis***

CNCGTGAGCTGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGGTTGTATGGTTGGTAAAGGTATGAAAC  
TTGTTTCGTTTCATACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTTGTTCGATTGAGAAGAAGTCAACTTC  
TTTCGCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTCGATATCATCTGAAAC  
GGCAACACCTTCAGCTTTAAGGTTTGCTTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAATTCCTTTAAGAAG  
AGCAACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATTTGTGTACGGAA  
CATTGCATTTCTGTTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGTCNTTTTTCTCTAA

**SEQ ID NO. 392     *Bacillus pumilus***

CNTACGCTGCTTCATAACAAGCGTAATCAAACGTAAATCGCTGGATTGTAAGGCTGGTAAAGATAAGACACTCG  
TTCGTTTCATTTCGATCAGCAGCCATTGTGTATTGAATCAAATCATTTGTTCCAATACTGAAGAAATCAACTTCTTT  
TGCGAATTGGTCTGCGATGACAGCGGTTGATGGAATTTCTACCATTATACCGATTTCAATGGAATCGGATACGTC  
TGTACCAGCGGCAACCAATGCTTCTTTTTCTTCAAGTAAAATGGCTTTTGCTTCTCTAAATTCTGATAATGTGCG  
GATCATAGGGAACATGATTTTCAAGTTTCCATATGTACTTGCACGAAGTAAGGCGCGTAGTTGTGTTCTGAAAAT  
CTCCTGTTCTTCGAGGCAAAGGCGGATCGCTCTAAAGCCNAAGAACGGATNTTTTTCTNTTAA

**SEQ ID NO. 393     *Bacillus species***

TGAGCGCATCGATAACCATTTTTACAAGACGTAAATAGATGGGTTATATGGTTGGTATAAGTATGATACTTGTT  
CGTTCATACGGTCTGCAGCCATTGTGTATTGGATTAAATCATTTGTTCCGATAGAGAAGAAGTCAACTTCTTTTCG  
CGAATTGATCTGCTAATACTGCTGAAGCTGGGATTTCAACCATCATACCAACTTCAATAGAATCAGAAACAGTTG  
TACCCGCTTCTACAAGTTTCGCTTCTCTTCTAATAAAAATTGCTTTTGCTTGACGGAACATCAAGAGTTGCAA

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TCATTGGGAACATAATTTTTAAGTTACCGTATACGCTAGCACGAAGTAATGCACGAAGTTGTGTACGGAACACAT  
CTTGCTCATCAAGACATAAGCGAATTGCACGGTATCCCAAGAACGGATCCNTTNTNCTTTAA

**SEQ ID NO. 394**     *Lactococcus lactis*

GTGAGCTGCTTTGATNCATTGTTAATCAAACGAAGGATTGATGGATTGTAAGGTTGGTAAAGGTAAGAACTTGT  
TCATTACATACGGTCTGCAGCCATTGTATATTGGATGAGGTCGTTTGTACCAATTGAGAAGAAATCAACTTCCTTA  
GCAAATTGGTCTGCAAGCATTGCTGCTGCTGGAATTTCAATCATGATACCTACTTCGATACCATCTGCAACTGGA  
ACACCTTCAGCAATCAATTTTGCTTTTTCTTCGTCATAAATCTTCTTAGCTGCACGGAACTCAGTTACGAGAGCA  
ACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGAAGCACGCAAGAGTGCACGCAATTGTGTACGGAACATT  
CCGTCACCAGCTGTTGAAAGGCTGATACGAAGTGCACGCCATCCCANGAACGGTNNTTTTTNTTTTAA

**SEQ ID NO. 395**     *Bacillus firmus*

TCCAGGANGGGTTCTNTCNTANGCTGCGTCAATTACCATTTTAACTAAACGCAGGATTGCAGGATTATACGGCTG  
GTAAAGGTAAGAAACACGCTCATTCATGCGGTCTGCAGCCATTGTGTACTGAATTAGATCATTAGTGCCAACT  
GAAGAAATCGACTTCTTTAGCAAACCTGATCAGCCATAACAGCAGTTGAAGGAATTTCAACCATAATTCCAATTC  
AATGTTGTGCGCAACCTCTGCTCCTTCGCTCACAAGCTTTTGTTTTCTTCTTCAAGGATTGCTTTGCCCTGACG  
GAATTCCTCAAGAGTGGCAATCATAGGGAACATGATTTTAAAGGTTTCCATAGGTGCTTGCTCTTAATAAAGCCCT  
TAATTGCGTCCTGAACATATCCTGTTCTTCCAGACACAGACGAATCGCCCGGAAGCCCAAGAACGGATTTCATTNT  
CTTA

**SEQ ID NO. 396**     *Haemophilus influenzae*

TGAGAGGCATCAATCACTTGTTTAATTAAACCAAGCACAGAGGGGTGCATCGGATTATAAAGATGGGAAATAAAC  
TCATTACCGCGATCTACAGCCAAAGTATATTGAGTTAAATCGTTAGTACCGATACTAAAGAAATCCACTTCTTTT  
GCTAAAAATTTTGATTTACTGCGGCAGAGGGGGTTTCGACCATTACACCAACTTGGATATTATTATCAAACAGT  
CTCCCCCTCTTCACGTAATTCGCTTTTAAATGTTTCAATAACCGCTTTTAAATTCGCCAATTTCTTCTACAGAAATA  
ATCATCGGGAACATTACCGCCAATTTACCAAAAGCTGAAGCACGTAACACCGCGCGTAATTGTGCATTTAAATTT  
TCACGACGATCTAATGCAATGCGAATCGCACGCCATCCCAAGAACGGATNNTTTTTTCTT

**SEQ ID NO. 397**     *Streptococcus bovis*

TGAGCTGCTTTGATAACGTTGTTAATCAAACGAAGGATTGATGGGTTATATGGTTGGTAAAGGTATGAACTTGT  
TCATTACATACGGTCAGCAGCCATTGTGTATTGGATAAGGTCGTTTGTTCGATTGAGAAGAAGTCAACTTCTTTT  
GCAAATTGGTCAGCAAGCATAGCTGCAGCTGGGATTTCAATCATGATACCAACTTGGATATCATCTGAAACGGCA  
ACACCTTCAGCTTTAAGGTTAGCTTTTTCTTCATCAAAGATTGCTTTAGCAGCACGGAATTCCTTAAGAAGTGCA  
ACCATTGGGAACATGATACGAAGTTGTCCGTGTACAGATGCACGAAGAAGTGCACGGATTTGTGTACGGAACATT  
GCATTTCTGTTTCTGAGATAGAAATACGAAGTGCACGGAATCCNAAGAACGGTCCNTTTTTNCTTA

**SEQ ID NO. 398**     *Enterococcus durans*

TGTGCTGCATCAATCACGTTTTTGATCAAACGTAAAATTGAAGGGTTATAAGGTTGATACAAGTAAGATACACGT  
TCGTTTCATGCGGTACGCTGCCATTGTGTATTGAATCAAGTCATTCGTACCTACTGAGAAGAAGTCAACTTCCTTC  
GCAAACCTTATCTGCTAAGACAGCTGCTGCAGGGATTTCAATCATGATGCCGACTTGGATCGTATCAGATACTTCC

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ACGCCTTCGCTCACTAATTTTTGTTTTCTTCTTCAAAGATTGCTTTCGCTGCACGGAATTCTTTAAGAGTCGCT  
ACCATTGGGAACATGATGCGTAAGTTTCCATGAACAGATGCACGTAACAATGCGCGCATTGTGTACGGAACATT  
TCGTACCTAATTCAGACAAGCTGATACGTAGCGCACGATAGCCCAAGAACGGATNNTTTTCCCTTAA

**SEQ ID NO. 399     *Streptococcus sanguis***

CGCATGAGCTGCCTTGATAACATTGTTAATCAAGCGAAGGATAGATGGATTGTAAGGTTGATAGAGGTAAGAGAC  
TTGCTCATTTCATCCGGTCAGCCGCCATAGTGTACTGAATCAAGTCGTTAGTACCAATTGAGAAGAAGTCTACTTC  
CTTGGCAAATTGATCCGCCAACATAGCTGCTGCTGGGATTTCAATCATGATACCCACTTGGATATTATCTGCTAC  
TGCAACGCCTTCAGCTTGCAGCTTAGCTTTTTCTTCGTCATAAACCGCTTTAGCTTTCGGAATTCTGTCAGAAG  
GGCCACCATTGGGAACATGATACGCAATTGTCCATGTACAGAAGCACGCAAGAGAGCGCGGATTTGTGTACGGAA  
CATAGCATCGCCAGTTTCAGAGATAGAGATACGCAAAGCACGGAAACCAAAGAACGGTNNTTTTTNTCTTTAAAA

**SEQ ID NO. 400     *Escherichia coli***

TCCTTTACCTTCTGCATGAGAGCATCAATAACTTGCTTGATCAAGTTCAGTACGGACGGTGACATTGGCTGGTAG  
AGATGTGAAATCATATCATTACCACGGTCAACTGCCAGGGTGTACTGCGTTAAATCATTGGTGCCGATACTAAAG  
AAATCAACTTCTTTGGCTAAATGACGCGCAATGGTCGCGGCTGCTGGTGTTCACCATTACGCCGATCTCAATT  
GACTCGTCAAATGCTTTACCTTCGTCACGCAATTCCTGTTTGTAGATCTCGATCTCTTCTTCAGTGCACGCACT  
TCTTCAACAGAGATGATCATCGGGAACATAATGCGCAGCTTACCGAAAGCAGAGGCACGCAGAATCGCACGCACC  
TGGTCACGCAGGATTTCTTTACGATCCATGGCGATACGCACTGCACGCCAGCCCAAGAACGGATNNTTTTTTCTT  
TAA

**SEQ ID NO. 401     *Serratia liquefaciens***

NTGNCTTCTGCATGAGNATGCATCAATAACCTGTTTGATCAGGCCAAGCACTGATGGGGACATCGGGTTATAGAG  
ATGAGAAATCAGCTCATTGCCCGCATCTACCGCCAGAGTATACTGGGTTAGATCGTTTGTCCCAATACTAAAGAA  
GTGCACTTCTTTGCCAGGTGATGAGCAATCACTGCCGCGGCGGCTGTTTCCACCATTACGCCCACTTCAATGGT  
CTCGTCAAAGGCCTTGGATTCTTCACGCAGCTGCGCCTTCAGCGTCTCGATTTACCTTTCAGATCGCGGACTTC  
TTCCACGGAAATGATCATCGGGAACATGATGCGCAGTTTGCCGAACGCGGAAGCGCGCAGGATGGCGCGCAGTTG  
CGCGTGCAGGATTTCTCTGCGGTCCATGGCGATACGAATCGCGCGCCAGCCNAAGAACGNTTNTTTTTANTTTA

**SEQ ID NO. 402     *Proteus mirabilis***

GTGTGATGCATCAATCACCTGTTTAATCAGATTAAGTACAGCAGGTGACATTGGATTATATAGATGAGATATCAG  
CTCATTTCCACGGTCTACAGCCAGAGTATATTGTGTTAGATCGTTAGTCCCAATACTGAAAAAGTCAACTTCTTT  
TGCCATATGGCGAGCCATAACAGCCGCTGCTGGCGTTTCAACCATAACACCGACTTCGATAGATTTCATCAAAAGG  
CTTATTTTCTTCACGAAGCTGGCTTTTCAGTATTTCAAGTTCCGCTTTCAATGCTCGGATCTCTTCAACAGAGAT  
AATCATTGGAAACATAATACGTAGTTTACCAAAGCAGACGCTCTTAAGATAGCACGTAATTGTGGATGAAGGAT  
CTCTTTGCGGTCAAGACAAATACGAATTGCACGCCAACCAAGAACGGAT

**SEQ ID NO. 403     *Proteus vulgaris***

CCTTCTGCATGTGATGCATCAATAACCTGTTTTATCAGGTTAAGTACTGCTGGTGACATTGGATTATACAGATGA  
GATATCAGCTCATTTCCACGGTCTACAGCCAGAGTATATTGTGTTAGATCGTTAGTCCCAATACTGAAAAAGTCA

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ACTTCTTTTGCCATGAGACGTGCCATTACGGCCGCCGCAGGGGTTTCAACCATGACACCGACTTCGATAGACTCA  
TCGAAAGTTTTGTTTTCTGCACGAAGCTGGCTTTTCAGTATTTCAAGTTCTGCTTTCAATGCGCGAATCTCTTCA  
ATAGAGATAATCATTGGAAACATAATGCGTAGTTTACCAAAAGCAGATGCTCTTAAGATAGCACGTAATTGCGAA  
TGAAGGATCTCTTTACGGTCAAGACAAATACGAATTGCTCTCCAACCCAAGAACGGTC



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**Figure 16 represents marker III (SpyM\_0902 & SpyM\_0903) sequences amplified from Gram-positive bacteria (SEQ ID NOs 404-412).**

**SEQ ID NO. 404     *Streptococcus pyogenes***

TTATTAGGCGCCGAAGGGGCAAGGCATACTGCTCAATCTCTCAGGCAAAAGGACAGAAGGTAAAATACAAACACC  
ATTAAGAACAGTCTTAGTCTTTTTTGTGTTTGCTGTTTTATCATTGCTTCAGAAGTTGTCTCAAAGAAAGAGATA  
GCTTTTTTCTTTTGGCGTCTTCGATGACTTTTAGGAGAGAAAGATGATAGCACTCGTTAAATTAATTGATAACCT  
TGTTTGGGGACCGCCCTCTTAATTTTATTGGTTGGGACGGGGATTACCTTACCAGTCATTTAGGATTAATTCA  
AATCTTAAAACTACCAAGAGCCTTTAAACTCATTTTTTCAGATGACGAAGGACATGGAGATATTTATCCTTTGC  
TGCTCTTGCAACTGCCCTTGCCGCTACTGTGCGAACTGGTAACATTGTTGGGGTTGCCACTGCTATCAAGTCTGG  
TGGTCCTGGAGCGCTCTTTTGGATGTGGGTTGCCGCTTTTTTTGGAATGGCCC

**SEQ ID NO. 405     *Streptococcus oralis***

CCGTAAAGGCACCGAAGGGGCAAGGCAGGTAAGTCTCAAACTCTCAGGTAAAAGGACAGAGCTAGGATAGACCG  
CTTTTTGGCATTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTACTCTTCTTTTGGGGTTGAAAGATAG  
GAGAAGGACATGTTAGAATTGCTTAAAGCGCTTGATGCTTTTGCTTGGGGGCCTCCCCTCTTGATCTTATTGGTC  
GGAACGGGTATCTATTTGACCATCCGACTGGGCCTTTTGCAGGTTACTCGTCTCCCTAAGGCCTTTCAGTTGATC  
TTTACCAAGGACAAGGGGCACGGCGATGTGTGAGCTTTGCTGCTCTCTGTACGGCTCTAGCAGCCACAGTTGGT  
ACGGGAAATATCATCGGGGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCTCTTTTGGATGTGGATGGCG  
GCCTTCTTTGGAATGGCCC

**SEQ ID NO. 406     *Streptococcus faecalis***

GTAAAGGCACCGAAGGGGCAAGGCAGGTAAGTCTCAAACTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCT  
TTTTGGCATTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTACTCTTCTTTTGGGGTTGAAAGATAGGA  
GAAGGACATGTTAGAATTGCTTAAAGCGCTTGATGCTTTTGCTTGGGGGCCTCCCCTCTTGATCTTATTGGTCGG  
AACGGGTATCTATTTGACCATCCGACTGGGCCTTTTGCAGGTTACTCGTCTCCCTAAGGCCTTTCAGTTGATCTT  
TACCAAGGACAAGGGGCACGGCGATGTGTGAGCTTTGCTGCTCTCTGTACGGCTCTAGCAGCCACAGTTGGTAC  
GGGAAATATCATCGGGGTAGCGACAGCCATTAAGGTTGGAGGACCAGGGGCCCTCTTTTGGATGTGGATGGCGGC  
CTTCTTTGGAATGGCCC

**SEQ ID NO. 407     *Streptococcus agalactiae***

TATAAGTAGCAACATCTTTGTATTGACACCAAGATGTGCTCTAGGCGCCGAAGGGGCAAGAAGAGTAAAACAACT  
CCTCCAATCTCTCAGGCAAAAGGACAGAAGCTAAAAGCCAATATTAATAATGAGTAGTAAGCTTATTAAGTTTAC  
TACTACCTTTATTTGTGCGCTTTTTAGCTAGCATCTTTCAGAAGTTATCTCTTTTAGAGATAACTTTTTTCGTTT  
CATTACAGAATCCATAGGTATGTCATGTATCAAAGGAGAACATATGCTAACACTTTTTACTCATATCAATAGCTT  
CGTTTGGGGTCCACCTTTACTTGCTTTATTAGTCGGAACAGGTATTTACCTATCATTTGCTTAGGTTTTGTTC  
ATTGAGACAACCTTTCTAGAGCTTTCAAATTGATTTTCCGAGAAGATAACGGACAAGGGGATATTTCAAGTTATGC  
TGCTCTTGCAACTGCTCTTGCTGCAACGGTAGGGACAGGTAATATCGTTGGTGTGGCTACGGCTATTAATCTGG  
AGGACCAGGAGCTTTGTTTTGGATGTGGGTAGCCGCTTTTTTTGGAATGGCCC

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**SEQ ID NO. 408     *Streptococcus pneumoniae***

GTAAAGGCACCGAAGGGGCAAGGCAGGCAACTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCT  
TTTTAGCATTTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTGCTCTTTCTTTTGGGGTTGAAACGATAGG  
AGAAGGAAATGTTAGAATTGCTTAAATCAATCGATGCTTTTGCTTGGGGACCGCCCTCTTGATTTTATTGGTTCG  
GAACAGGGATTTACCTAACCATGCGGCTAGGACTCTTGCAAGTTTTGCGTCTGCCCAAGGCCTTTCAGCTTATTT  
TTATCCAGGATAAGGGACATGGTGATGTATCCAGTTTTACAGCTCTGTGTACAGCCTTGGCATCAACTGTTGGAA  
CAGGAAATATCATAGGAGTTGCGACGGCTATCAAGTTGGTGGACCAGGAGCTCTATTTTGGATGTGGATGGCGG  
TTTTCTTTGGAATGGCCC

**SEQ ID NO. 409     *Enterococcus durans***

NGNCCGAGGGGCAAGGTCAGNACAACCTGCTCAAACCTCTCAGGTAAAAGGACAGAGCTAGGATAGACCGCTTTT  
GCATTTATCTAAGCATTCCAGAGTACATGTATCTTGCATGTGCTCTTTCTTTTGGGGTTGAAACGATAGGAGAAG  
GAAATGTTAGAATTGCTTAAATCAATCGATGCTTTTGCTTGGGGACCGCCCTCTTGATTTTATTGGTCGGAACA  
GGGATTTACCTAACCATGCGGCTAGGACTCTTGCAAGTTTTGCGTCTGCCCAAGGCCTTTCAGCTTATTTTTATC  
CAGGATAAGGGACATGGTGATGTATCCAGTTTTACAGCTCTGTGTACAGCCTTGGCATCAACTGTTGGAACAGGA  
AATATCATAGGAGTTGCGACGGCTATCAAGTTGGTGGACCAGGAGCTCTATTTTGGATGTGGATGGCGGTTTTC  
TTTGGAATGGCCC

**SEQ ID NO. 410     *Streptococcus anthracis***

CCCCCTCTCGCTTTAAATAGCGTAGAGGAAAACGAGCACC GAAGGAGCAAATCCGCTACTATAGCGGATAATCTC  
TCAGGTAAAAGGACAGAGACAAGCGAAAGAAAATGCCGATTTGTATCGGTTTATTTTTCTATCCCTTGTTTCTCC  
AGAGACCATTTTCATTTACTTGAAGTGGTTTTTATTTTTTCTAAAAAAGGAGAATAAAGATGGAGACAGTAAGTAA  
AGTATTAGAACAAATCAATCACTATGTGTGGGGATTACCAACGTTATTGTTACTCGTTGGTACTGGTATTATTCT  
CACAGTGCGTTTTAAAGGTTTACAGTTTAGTAACTATTATACGCTCACAACTAGCTTTTAAAAAATCAGAAGA  
TACATCTTCCTCTGGAGATATTAGCCACTTCCAAGCGCTTATGACAGCTATGGCGGCAACGATTGGTATGGGAAA  
TATAGCTGGTGTTGCAACTGCTGTGACGATCGGTGGACCTGGTGCAATCTTTTGGATGTGGATTACTGCTTTGTT  
TGGAATGGCCC

**SEQ ID NO. 411     *Bacillus cereus***

CCCCCTCAGCCTATCATATAGTGCAGAGGAAACAGAGCACC GAAGGAGCAAATCCGCTGTATTAGCGGATAATC  
TCTCAGGTAAAAGGACAGAGACAAGCGAAAGAAAACGCCGATTTGTATCGGTTTATTTTTCTATTCCCTTGTTTCT  
CCAGAGACCATTTTCATTTATGTGAAGTGGTTTTTATTTTTTCTAAAAGGAGAATAAAGATGGAGACAGTAAGTA  
AAGTATTAGAACAAATCAATCACTACGTATGGGGATTACCAACCTTATTCCTTTTAGTCGGGACTGGAATCATTC  
TCACAGTGCGTCTAAAAGGTTTGCAGTTTAGTAACTGTTATACGCTCACAACTAGCATTTTCGAAAATCAGAAG  
ATACATCTTCTTTGGGAGATATTAGTCATTTCCAAGCACTCATGACAGCAATGGCCGCCACCATCGGGATGGGAA  
ATATAGCTGGTGTCGCAACAGCTGTTACAATCGGTGGACCGGGGCAATATTTTGGATGTGGATCACTGCCTTGT  
TTGGAATGGCCC

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**SEQ ID NO. 412     *Streptococcus mutans***

ACTGATAATTGACGGACTTCTGGAGAGACCTACTAGGCGCCGAAGGGGCAAGGCTGTTTGCTCAAACCTCTCAGGC  
AAAAGGACAGAAAAGAAAAAAGAATTTTAAATGTTGAAACAATTCTTATCTTCTAACTCTAGAGGTATCGTCAA  
GTATTGACAACCTCTTTTTTGATTTCCATTTTCGGTTTATGAGGAGAAAAGTTTATATGTTAACATTTTTTAAAGC  
TCTAGACAGCCTTGTCTGGGGTGCTCCCTATTAGTTCTTTTAGTCGGTACTGGAATTTATTTGAGTACTCGCTT  
AAGATTATTGCAGGTGTTGAAACTCCCTTTAGCCTTTAAACTCATCTTTGCCGAGGACAAAGGGGAAGGTGATAT  
TTCGAGTTTTGCGGCTTTAGCTACCGCTCTTGCTGCCACTGTTGGAAGTGGAAATATCGTTGGTGTGCGCACTGC  
AATCAAAGCTGGCGGTCCGGGAGCACTCTTTTGGATGTGGATAGCAGCTTTTTTTGGTATGGCAACTAAATATGC  
CGAAGGTCTTCTGGCTATAAAATACCGTACTAAGGA

**Figure 17 represents marker IV (Spy1527, a putative GTP-binding factor plus 160 nt downstream) sequences amplified from Gram-positive bacteria (SEQ ID NOs 413-425).**

**SEQ ID NO. 413 *Listeria monocytogenes***

GTTAGAAAAAGGAAGTTCTATTGTAGCATCGCCAAAAATCCATCAAACCTTATTAGATAACTACCTGCCTTAAAG  
AAAGCGCTCAACATAAAAAAACTTGTTTTTCAGAAAAATAAAATCGTGCCAAATCGGCTCAGCTATGCTATAATAG  
GTAAGTTGATTTAAACGAGACGATAGCGACGGAGGAAAAATAAATCTATTTTCCTCTTTCTTTTGGCTAATCTTCA  
CGATAAATGTTTGGATTTTAAATTTAGGAGGAAACAAGATTGAATTTAAGAAATGATATTCGTAATGTAGCAATT  
ATTGCCCACGTTGACCATGGTAAAACAACCTCTAGTAGACCAATTATTACGCCAGTCAGGCACATTCCGCGACAAT  
GAAACAGTTGCAGAACGCGCAATGGACAACAATGATTTAGAAAGAGAACGCGGTATTACAATTTTAGCGAAAAAT  
ACAGCGATTAAGTATGAAGATACACGTGTAAACATCATGGATACACCTGGACACGCCGATTTCCGGTGGAGAAGTA  
GAACGTATCATGAAATGGTTGATGGTGTCTTTTAGTAGTGGACGCGTATGAAGGTACGATGCCTCAAACACGT  
TTTGTACTAAAAAAGCACTAGAACAAAACCTAACTCCAATCGTAGTAGTAAACAAAATTGACCGTGACTTTGCT  
CGCCCAGAAGAAGTTGTTGATGAAGTATTAGAATTATTCATCGAACTAGGCGCAAACGACGATCAATTAGAATTC  
CCAGTTGTTTATGCTTCTGCAATCAACGGAACCTCAAGCTATGATTCCGATCCAGCAGAACAAAAAGAAACAATG  
AAACCACTTTTAGACACAATTATCGAACATATCCCGGCTCCAGTTGATAATAGCGACGAACCATTACAATTCCAA  
GTATCATTACTTGATTATAATGACTATGTTGGTCGTATCGGTATTGGCCGCGTATTCCGTGGAACAATGCACGTG  
GGACAAACAGTTGCTTTAATTAAACTTGATGGCACAGTAAACAATTCGGTGTAACGAAAATGTTCCGGTTTCTTC  
GGACTAAAACGTGACGAAATTAAAGAAGCAAAAGCTGGTGATTTAGTAGCATTAGCAGGTATGGAAGACATCTTC  
GTTGGTGAAACAGTAACACCATTGACCACCAAGAAGCACTTCCGTTATTACGTATTGATGAGCCAACCTTGCAA  
ATGACTTTCGTAACAAATAACAGTCCTTTTCGCTGGTCGTGAAGGTAAACACGTAACAAGCCGTAAAATTGAAGAA  
CGTTTACTTGCAGAGCTTCAAACGGACGTATCTTTACGCGTAGAGCCAACAGCTTCCCCTGACGCTTGGGTAGTT  
TCTGGTCGTGGTGAGCTTCATTTATCCATTTTGATCGAAACAATGCGTCGCGAAGGTTATGAATTACAAGTTTCT  
AAACCAGAAGTAATCATCCGTGAAATTGATGGCGTGAAATGTGAACCAGTAGAAGATGTTCAAATTGATACTCCA  
GAAGAATTCATGGGTTCCGTTATTGAATCTATCAGCCAACGTAAAGGCGAAATGAAAAACATGATTAACGATGGC  
AACGGACAAGTTCGTTTACAATTATGTTCCAGCTCGTGGCTTAATCGGTTATACAACCTGATTTCTTTCAATG  
ACTCGTGGTTATGGTATTATCAACCACACA

**SEQ ID NO. 414 *Listeria innocua***

ATAAAAAAACTCATTTTCAGAAAATAAAAAATAGTGCTAAATCCGCTTAGCTATGCTATAATAGGTAAGTTGATTT  
AAACGAGACGATAGCGACGGAGGAAAATAAATCTATTTTCCTCTTTCTTTTGGCTAATCTTCACGATAAATGTTT  
GGATTTTAAATTTAGGAGGAAACAAGATTGAATTTAAGAAACGATATTCGTAATGTAGCAATTATTGCCCACGTT  
GACCATGGTAAACTACACTAGTAGACCAATTACTACGCCAATCAGGTACTTCCGCGACAATGAAACAGTTGCA  
GAACGTGCAATGGACAACAATGATTTAGAAAGAGAACGCGGTATTACAATTTTAGCGAAAAATACAGCAATTAAG  
TATGAAGATACACGCGTAAACATCATGGATACACCTGGACACGCCGATTTTGGTGGAGAAGTAGAACGTATCATG  
AAAATGGTTGATGGTGTCTTTTAGTAGTGGACGCGTATGAAGGTACTATGCCTCAAACACGTTTTGTACTAAAA  
AAAGCACTAGAACAAAACCTAACTCCAATCGTAGTAGTAAACAAAATTGACCGTGACTTTGCTCGCCAGAAGAA  
GTTGTTGATGAAGTACTAGAATTATTCATCGAACTAGGTGCGAACGACGATCAATTAGAATTCCCAGTTGTTTAT  
GCTTCTGCAATTAACGGAACCTCAAGCTTTGAATCCGACCCAGCAGAACAAAAAGAAACAATGAAACCACTTTTA

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GACACTATTATTGAACATATTCCAGCTCCAGTTGATAACAGCGACGAGCCATTACAATTCCAAGTTTCTTTACTT  
GATTATAATGACTATGTTGGTCGTATTGGTATTGGCCGCGTTTTCCGTGGAACAATGCACGTAGGACAAACAGTT  
GCCTTAATTAAACTAGACGGCACAGTAAAACAATTCCGTGTAACGAAAATGTTTCGGTTTCTTCGGACTAAAACGT  
GACGAAATTAAAGAAGCAAAAGCGGGTGACTTAGTAGCACTTGCAAGGAATGGAAGACATCTTCGTGGTGAAACA  
GTAACACCATTTGACCACCAAGAAGCACTTCCACTTTTACGTATTGATGAGCCAACCTTGCAAATGACTTTTGTA  
ACAAATAACAGTCCTTTTCGCAGGCCGTGAAGGTAAACACGTAACAAGCCGTAAAATTGAAGAACGCTTACTTGCA  
GAACTTCAAACGGATGTATCTTTACGCGTTGAACCAACAGCTTCTCCAGACGCATGGGTAGTATCTGGTCGTGGT  
GAGCTTCACTTGTCTATCTTAATTGAAACGATGCGTCGTGAAGGTTATGAGTTACAAGTTTCTAAACCAGAAGTA  
ATCATCCGTGAAATCGATGGCGTGAAATGTGAACAGTAGAAGACGTTCAAATTGATACTCCAGAAGAATTTCATG  
GGTTCAGTTATTGAATCTATCAGCCAACGTAAAGGCGAAATGAAAAACATGATTAACGACGGCAATGGCCAAGTT  
CGTTTACAATTCATGGTTCCAGCTCGTGGATTAATCGGTTATACAACGATTTCCTTTCAATGACACGTGGTTAT  
GGTATTATCAACCATACATTCGATAGCTACCAACCAATCCAAAA

**SEQ ID NO. 415      *Bacillus cereus***

TTACTTTTCAAAAAGTAAGAATACAACTATATTTTCATTCTTGCTTTTATTTTAATTGCTATTGTATCCCCTTCG  
CTCTTATAATAGAGAAGGATTAAAAAGACATTAGGAGTTGGACATGTTGAAAAACGACAAGATTTACGTAATAT  
AGCAATTATTGCCCACGTTGACCATGGTAAAACAACACTTGTGACCAGTTATTACGTCAAGCGGGGACTTTCCG  
TGCGAACGAACACGTTGAAGAACGCGCAATGGATTCAAATGATCTAGAAAGAGAACGCGGTATTACAATTTTAGC  
GAAAAATACAGCGATTCACTATGAAGATAAAAGAATTAACATTTTAGATACACCTGGTCACGCTGACTTCGGTGG  
AGAAGTAGAACGTATCATGAAAATGGTTGATGGTGTCTTACTTGTGTTGATGCATATGAAGGTTGTATGCCACA  
AACACGATTTGTTTTAAAGAAAAGCTCTTGAGCAAACTTAACCTCAATCGTAGTTGTAAACAAAATTGACCGTGA  
CTTCGCTCGTCCAGATGAAGTAGTTGATGAAGTAATCGACTTATTCATTGAGCTTGGTGCAAACGAAGATCAATT  
AGAGTTCCCAGTTGTATTTGCATCAGCAATGAACGGAACAGCAAGCTTAGATTCAAATCCAGCAAATCAAGAAGA  
GAATATGAAATCATTATTCGATACAATTATCGAACATATTCCAGCACCATTGATAACAGCGAAGAGCCACTTCA  
ATTCCAAGTAGCACTTCTTGATTACAACGACTACGTTGGACGTATTGGAGTTGGTCGCGTATTCCGCGGTACAAT  
GAAGGTTGGACAACAAGTTGCTTTAATGAAAGTAGACGGAAGCGTGAAGCAATTCCGCGTAACGAAATTATTCGG  
TTACATGGGATTAAACGTCAAGAAAATTGAAGAAGCAAAAGCAGGGGACTTAGTAGCCGTTTCTGGTATGGAAGA  
CATTACGTAGGTGAAACAGTATGTCCAGTTGAACATCAAGATGCGTTACCATTATTACGTATTGATGAGCCAAC  
ACTACAAATGACGTTCCCTTGTAATAACAGCCCATTTCGAGGTCGTGAAGGTAAATACATTACATCTCGTAAAAT  
TGAAGAGCGTCTTCGTTTCAATATAGAAACAGATGTAAGTTTACGTGTAGATAATACAGATTCTCCTGATGCGTG  
GATCGTATCTGGACGTGGGGAACCTACATTTATCTATCTTAATTGAAAACATGCGTCGTGAAGGTTATGAATTACA  
AGTATCTAAGCCAGAAGTAATCATTAAGAAGTTGATGGCGTAAGATGTGAGCCTGTAGAGCGGTACAAATCGA  
TGTACCTGAAGAATACACTGGTTCTATTAT

**SEQ ID NO. 416      *Bacillus anthracis***

CTATATTTTCATTCTTGATTTTATTTTAATTGCTATTGTATCCCCTTCGCTCTTATAATAGAGAAGGATTAAAAA  
GACATTAGGAGTTGGACATGTTGAAAAAACGACAAGATTTACGTAATATAGCAATTATTGCCCACGTTGACCATG  
GTAAAACAACACTTGTGACCAGTTATTACGTCAAGCGGGGACTTTCCGTGCGAACGAACACGTTGAAGAACGCG  
CAATGGATTCAAATGATCTAGAAAAGAGAACGCGGTATTACAATTTTAGCGAAAAATACTGCGATTCACTATGAAG  
ATAAAAGAATTAACATTTTAGATACACCAGGTCACGCTGACTTCGGTGGAGAAGTAGAACGTATTATGAAAATGG  
TTGATGGTGTATTACTTGTGTTGATGCATATGAAGGTTGTATGCCACAAACACGATTTGTTTTAAAGAAAGCTC

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TTGAGCAAACTTAACTCCAATCGTAGTTGTAAATAAAATTGACCGTGACTTCGCTCGTCCTGATGAAGTAGTTG  
ATGAAGTAATCGACTTATTCATCGAACTTGGTGCAAACGAAGATCAATTAGAGTTCCCAGTTGTATTTGCATCAG  
CAATGAACGGAACAGCAAGCTTAGATTCAAACCCAGCAAATCAAGAAGAGAATATGAAATCATTATTTGATACAA  
TTATTGAACATATTCCTGCACCAATTGATAACAGCGAAGAGCCACTTCAATTCCAAGTAGCACTTCTTGATTACA  
ACGACTATGTTGGACGTATCGGGGTTGGACGCGTATTCGCGGGTACAATGAAGGTTGGACAACAAGTTGCTTTAA  
TGAAAGTAGACGGAAGTGTAACAATTCCGCGTAACGAACTATTTGGTTATATGGGATTAACCGTCAAGAAA  
TTGAAGAAGCAAAAGCTGGAGACTTAGTAGCTGTTTCTGGTATGGAAGACATTAACGTAGGTGAAACAGTATGTC  
CAGTTGAACATCAAGATGCGTTACCATTATTACGTATTGATGAGCCAACACTACAAATGACATTCCTTGTAATA  
ACAGCCCATTTCAGGTTCGTGAAGGTAAATACATTACATCTCGTAAAATTGAAGAGCGTCTTCGTTCACAATTAG  
AAACAGATGTAAGTTTACGCGTAGATAATACAGAATCTCCTGATGCGTGGATCGTATCTGGACGTGGGGAACAC  
ATTTATCTATCTTAATCGAAAACATGCGTCGTGAAGGTTATGAACTACAAGTATCTAAACCAGAAGTAATCATT  
AAGAAGTTGATGGCGTAAGATGTGAGCCTGTAGAGCGTGTGCAAATTGATGTACCTGAAGAATACACTGGTTCTA  
TTATGGAATCTATGGGTGCACGTAAAGGTGAAATGTTAGATATGGTGAATAACGGAAACGGTCAAGTTCGCCTTA  
CTTTCATGGTTCAGCACGTGGTTTAATTGGTTACACAACAGAATTCTTAACATTAACCTCGTGGTTACGGTATTT  
TAAACCATACATTCGATTGCTACCAACCAGTACACGCTGGACAAGTTGGTGGACGTGTCAGGTGTTCTAGTTT  
CACTTGAAACAGGAAAAGCATCACAATACGGTATTATGCAAGTTGAAGACCGTGGTGTAATCTTCGTTGAACCAG  
GTACAGAAGTATATGCTGGTATGA  
TTGTTG

**SEQ ID NO. 417 *Staphylococcus aureus***

TCAATTATATGATATAATAAAAAAGTTGTAATTAAAAGTGGGATTTTACTTAAGAAAGAAGGAAACTATTTATAT  
GACTAATAAAAGAGAAGATGTCCGCAATATAGCAATTATTGCTCACGTTGACCATGGTAAAACAACCTTTAGTAGA  
TGAGTTGTTAAAACAATCTGGTATATTTCAGAGAAAATGAACATGTCGATGAACGTGCAATGGACTCTAACGATAT  
CGAAAGAGAGCGTGGAAATTACGATTCTAGCCAAAAATACGGCTGTTGATTATAAAGGTACACGTATTAATATTTT  
GGATACACCAGGACATGCAGACTTTGGTGGAGAAGTAGAACGTATTATGAAAATGGTTGATGGGGTTGTCTTAGT  
AGTAGATGCGTATGAAGGTACAATGCCTCAAACACGTTTTGTACTTAAAAAAGCGCTAGAACAAAACCTGAAACC  
TGTTGTTGTTGTTAATAAAATTGATAAACCATCAGCACGTCCAGAGGGTGTGTTAGATGAAGTTTTAGATTTATT  
TATTGAATTAGAAGCAAACGATGAACAATTAGAATTCCTGTTGTTTATGCTTCAGCAGTAAATGGAACAGCTAG  
CTTAGATCCTGAAAAACAAGATGATAATTTACAATCATTATATGAAACAATTATTGATTATGTACCAGCTCCAAT  
TGATAACAGTGATGAGCCATTACAATTCAGTAGCATTGTTGGACTACAATGATTATGTTGGACGTATTGGTAT  
TGGTCGTGTATTCAGAGGTAATGCGTGTGCGGAGATAATGTATCACTAATTAAATTAGACGGTACAGTGAAAAA  
CTTCCGTGTAACATAAATCTTTGGTTACTTTGGATTAAAACGTTTAGAAATTGAAGAAGCACAAGCTGGAGATTT  
AATTGCTGTTTCAGGTATGGAAGACATTAATGTTGGTGAACTGTAACACCACATGACCATCAAGAAGCATTGCC  
AGTTCTACGTATTGATGAGCCTACTCTTGAAATGACATTTAAAGTTAACAATTCCTCATTGCTGGCCGTGAAGG  
TGACTTTGTAACAGCACGTCAAATTCAGAACGTTTAAATCAACAATTAGAAACAGATGTATCTTTGAAAGTTTC  
TAACACAGATTCTCCAGATACATGGGTAGTTGCTGGTCGCGGTGAATTGCATTTATCAATCCTTATTGAAAATAT  
GCGTCGTGAAGGTTATGAATTACAAGTTTCAAACCAACAAGTAATTATTAAAGAAATAGATGGTGTAATG

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**SEQ ID NO. 418 *Staphylococcus epidermidis***

ACCCACCTTTTACTTATCTTTTCAATAATATATGATATAATAAACAGTTGCAATTAAAAGTGGGAGTATACAC  
AAGAAAGGAATTTATAAAATGACTAATTTAAGAGAAGATGTTTCGTAATATAGCGATTATTGCGCATGTCGACCAT  
GGTAAACAACATTAGTAGACCAGTTGCTTAAACAATCAGGTATATTTTCGTGAAAACGAACATGTCGACGAGCGT  
GCAATGGACTCTAATGATTTAGAAAGAGAACGTGGTATTACGATTCTTGCTAAGAATACAGCGATAGATTATAAA  
GGAACGCGTATCAATATATTAGACACACCTGGCCACGCCGATTTTGGTGGTGAAGTTGAACGTATCATGAAAATG  
GTTGACGGTGTCTACTAGTGGTTGACGCATATGAAGGTACAATGCCTCAAACCTCGTTTTGTTCTTAAAAAAGCT  
TTAGAACAAAACCTTAAAACCGGTTGTAGTTGTGAATAAAATTGATAAACAGCTGCTAGACCTGAGGGAGTTGTA  
GATGAAGTATTAGACTTATTCATTGAATTGGAAGCGAATGATGAGCAATTAGACTTCCCAGTTGTTTATGCTTCA  
GCTGTGAATGGAACAGCAAGTTTAGACTCTGAAAAGCAAGACGAAAATATGCAATCCCTATACGAGACGATTATT  
GACTATGTACCGGCACCAGTAGATAATTCAGATGAACCATTACAATTCCAAATTGCTTTACTAGATTATAATGAT  
TATGTAGGTCTGTATAGGCGTTGGACGTGTGTTTCAGAGGTAAAATGCGTGTAGGTGATAATGTATCACTAATTAAA  
TTAGATGGTACAGTTAAGAACCTTTCGTGTGACGAAAATATTTGGTTACTTTGGTCTTAAACGTGAAGAAATTGAA  
GAAGCACAAGCAGGAGACTTAATAGCTGTTTTCAGGTATGGAAGATATTAACGTTGGTGAAACAGTTACACCACAT  
GATCATCGTGACCCATTACCGGTGTTACGTATTGATGAACCAACCCTAGAAATGACTTTTAAAGTAAATAACTCT  
CCGTTTGCTGGACGTGAAGGTGATTATGTAACAGCTCGACAAATTCAGAAAGATTAGATCAACAACCTGAAACA  
GATGTTTTCTTTAAAGTTACACCTACTGATCAACCAGATTCATGGGTTGTTGCTGGTGGTGAACCTACACTTG  
TCTATTCTTATTGAAAACATGAGACGTGAAGGCTTTGAATTACAGGTTTCTAAACCTCAAGTTATTTTAAAGAGAA  
ATCGATGGTGTGTTAAGTGAACCATTTGAGCGTGTACAATGTGAA

**SEQ ID NO. 419 *Bacillus subtilis***

GAAAAACGTGACGCTTTTAAAGAGGATGTGTGATATAATATGAAAGTTATCTAATTTTTTTTAGGAGATGAAAAAG  
TGAAACTTCGAAATGATCTTCGCAACATCGCGATTATTGCCACGTTGACCATGGGAAAACGACTCTAGTCGATC  
AGCTTTTACATCAGGCTGGTACGTTCCGTGCCAACGAACAGGTTGCTGAACGCGCAATGGACTCTAATGATCTTG  
AACGCGAACGCGGCATTACAATATTGGCGAAAAATACTGCGATTAACCTATAAAGATACACGTATCAATATTTTGG  
ACACCCCTGGACATGCAGACTTTGGGGGAGAAGTAGAACGGATTATGAAAATGGTTGACGGCGTAGTGCTTGTCG  
TTGACGCATATGAAGGCTGTATGCCTCAAACCTCGTTTTGTTCTGAAAAAAGCTCTTGAGCAAAACCTGAACCCTG  
TTGTTGTTGTAAACAAAATTGACCGTGACTTTGCTCGTCCAGAGGAAGTTATCGATGAAGTTCTGGATCTGTTCA  
TTGAGCTTGATGCCAATGAAGAGCAGCTCGAGTTCCCAGTGGTATATGCTTCCGCGATTAATGGAACAGCGAGTC  
TTGATCCGAAACAACAGGATGAAAACATGGAAGCTTTATATGAAACCATTATTAAGCATGTTCCGGCACCTGTTG  
ATAATGCAGAGGAGCCGCTTCAATTCGAAGTTGCCCTTCTTGACTACAACGACTATGTAGGCCGTATCGGAATCG  
GACGCGTATTCCGCGGCACAATGAAAGTCGGACAGCAGGTTTCTCTTATGAAGCTTGACGGAACGGCAAAGTCAT  
TCCGTGTTACAAAGATTTTTGGTTTCCAAGGCTTAAAGCGTGTGGAAATTGAAGAAGCAAAAGCGGGAGACCTCG  
TTGCGGTTTTCCGGGATGGAAGATATCAACGTTGGTGAAACGGTATGTCCTGTAGACCATCAAGATCCGCTTCCGG  
TCCTTCGCATTGATGAGCCGACACTTCAAATGACATTTGTCTGTAATAACAGTCCGTTTGCAGGCCGTGAAGGCA  
AATATGTAACGGCCCGCAAAATCGAAGAGCGTCTTCAATCACAGCTTCAGACGGATGTGAGCTTGCGTGTTGAGC  
CAACAGCTTCTCCTGATGCTTGGGTTGTTTCAGGACGCGGTGAGCTGCACTTGTCAATTTTAATTGAAAATATGC  
GTCGTGAGGGCTATGAGCTTCAAGTGTCAAACCTGAAGTTATTATCAAAGAAATCGACGGCGTACGCTGTGAGC  
CTGTTGAACGTGTGCAAATTGATGTTTCTGAAGAGCATACTGGCT

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**SEQ ID NO. 420 *Streptococcus mutans***

GGAATGGAAGTAAAGAGAAGAATTAGTTCTTTTTTGAGATAATGACAGGGATTAGTATGAGCTGTTGTCTTT  
TGTTTTTGCAATACTGGTTGATTGAGGACTTATTTTATAAAATTTGGAGATACCAAGACTGCGACTTTGCTATCT  
TGGTTTTTCTTTTATATTTTAAACATTTACATATCTCTCCTGAGTTTTTCCCTAATTTTTATGGTATAATAGAT  
AAGTTGAAATAAATTAATGTAAATGTAAGAGGAATTATGACAAATTTTAGAGAAGATATTAGAAATGTTGCTAT  
CATTGCCCACGTTGACCATGGGAAAACAACCCTTGTTGATGAGCTCTTAAACAATCGCATACACTTGATGAGCA  
TAAAAAATTAGAAGAACGTGCGATGGACTCTAATGATCTTGAAAAAGAGCGTGGGATTACTATTCTTGCAAAAA  
TACTGCTGTTGCCTACAATGGTGTACGTATTAACATTATGGACACACCAGGACATGCGGATTTTGGTGGAGAAGT  
AGAGCGTATCATGAAAATGGTTGATGGGGTGTCTTGTGTTGATGCTTATGAAGGTACCATGCCGCAAACACG  
TTTTGTTTTGAAAAAGCTTTGGAACAAAACCTGGTTCCAATCGTGGTGGTGAATAAGATTGACAAGCCATCAGC  
TCGTCCGGCAGAAGTTGTTGATGAAGTTCTTGAACTTTTATTGAACCTTGGAGCAGATGATGACCAGTTAGAGTT  
TCCAGTCGTTTACGCTTCGGCGATTAATGGAACCTTCTTATTATCAGATGAACCAGCGGATCAAGAACATACAAT  
GGCACCCGTTTTTGATACATATTATTGAGCATATTCCAGCACCGATCGATAATTCAGATCAGCCACTTCAATTTCA  
AGTGCTCTCCTTGATTATAACGACTTTGTTGGACGTATCGGTATTGGGCGAGTCTTCCGTGGTTCTGTTAAAGT  
CGGGGATCAAGTGACACTTTCTAACTTGATGGTACAACAAAGAATTTTCGTGTTACAAAACCTTTCCGTTCCTT  
CGGTTTGAACGTCGTGAGATTAAGGAAGCTAAGGCTGGCGATTTGATTGCTGTTTCAGGTATGGAAGATATCTT  
TGTTGGTGAAACGATTACACCACTGATGCTGTAGAACCCTTCTATTCTTACATTGATGAGCCAACCTCTGCA  
AATGACCTTTTTAGCTAACAATCCCCCTTTGACAGCCGTGAAGGTAAATTTGTAACCTCGCGTAAGGTAGAAGA  
GCGTTTGTGGCAGAATTGCAAACAGATGTTTCCCTTCGTGTAGAAGCCACTGACTCACCAGATAAATGGACGGT  
TTCAGGTGCTGGGGAGTTACATCTGTCAATCCTTATTGAAACCATGCGCCGTGAAGGATATGAGCTGCAAGTATC  
GCGTCCAGAAGTTATTATCAAAGAAATTGATGGCATCAAATGTGAGCCATTTGAACGCGTGCAAATTGACACACC  
GGAAGAATACCAAGGTGCTGTTATCCAGTCCCTTTCAGAACGTAAAGGTGAAATGCTTGA

**SEQ ID NO. 421 *Streptococcus pneumoniae***

AAGCGGAGTGAAAACATTTACACTTGCTTGAGTTATGTTATTTATTTGAAATTATGGTATAATCGTTTCAAGTTAGA  
AAATAAATTTTGAATATTATAGAGGAAATCATGACAAAATTAAGAGAAGATATCCGTAACATTGCGATTATCGCC  
CACGTTGACCACGGTAAAACAACCCTGGTTGACGAATTATTGAAACAATCAGAAACGCTTGATGCACGTAAGTAA  
TTGGCAGAGCGTGCTATGGACTCAAACGATATCGAAAAAGAGCGTGGAATCACCATCCTTGCTAAAAATACTGCC  
GTTGCTTACAACGGAACCTCGTATCAACATTATGGACACACCAGGACACGCGGACTTCGGTGGAGAAGTTGAGCGT  
ATCATGAAAATGGTTGACGGTGTGTCTTGGTCGTAGATGCCTATGAAGGAACCATGCCACAACTCGTTTTCGTA  
TTGAAAAAAGCCTTGGAACAAGACCTTGTCCCAATCGTGGTTGTTAACAAAATCGATAAGCCATCAGCTCGTCCA  
GCAGAAGTAGTGATGAAGTCTTGGAACTTTTATCGAGCTTGGTGCAGATGACGACCAGCTTGATTTCCAGTG  
GTTTATGCTTCAGCGATCAACGGAACCTTCTTATTGTCAGATGATCCAGCTGACCAAGAAGCGACTATGGCACCA  
ATCTTTGACACGATTATCGACCATATCCCAGCTCCAGTAGATAACTCAGATGAGCCTTTGCAGTTCCAAGTGTCA  
CTTTTGGACTACAATGACTTCGTTGGACGTATCGGTATCGGTGCTGTCTTCCGTGGTACAGTTAAGGTTGGGGAC  
CAAGTTACCCCTTTCTAACTTGACGGTACAACATAAACTTCCGTGTTACAAAACCTTTCGGTTTTCTTTGGTTTG  
GAACGTCGTGAAATCCAAGAAGCCAAAGCGGGTGACTTGATTGCCGTTTCAGGTATGGAAGACATCTTTGTGCGGT  
GAAACCATCACTCCGACAGATGCAGTAGAAGCTCTTCCAATCTACACATCGATGAGCCAACCTTCAAATGACT  
TTCTTGGTCAACAACCTCACCATTTGCTGGTAAAGAAGGTAAATGGGTAACCTTCTCGTAAGGTGGAAGAAGCCTTG



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CAGGCAGAATTGCAAACAGACGTTTCCCTTCGTGTTGACCCAAC TGATTACCAGATAAATGGACTGTTTCAGGA  
CGTGGAGAATTGCACTTGTCAATCCTTATCGAAACAATGCGTCGTGAGGGCTATGAACT

**SEQ ID NO. 422 *Streptococcus agalactiae***

AGAAATGAATTAAATTGAAAAAGTAGAAAAATAATGGCATAAATAATGAAATGATGAAAAGTTTTCTTATCACA  
AATAGGCAGTTAATATGAAAACATTTACACTTGTGTAAATTCTGTTTTTTAAGAAAAATTGTGTTATAATTCATA  
AGTTAACAGAATTACATTATAAAATAGAGGAAAACATGACAAATTTAAGAACAGATATCCGTAACGTTGCGATCA  
TTGCCACGTTGACCACGGTAAAACAACCTCTCGTTGATGAATTATTAAAACAATCACATACTCTTGATGAGCGTA  
AAGAGCTTGAAGAACGTGCAATGGATTCAAATGATATCGAAAAAGAACGTGGTATCACCATTCTTGCAAAAAATA  
CAGCCGTAGCATACAACGATGTTTCGTATCAATATTATGGACACACCTGGTCACGCGGACTTTGGTGGTGAAGTTG  
AGCGTATTATGAAAATGGTTGATGGTGTGTTTTAGTCGTTGATGCCTACGAAGGAACAATGCCACAAACACGTT  
TTGTTTTGAAGAAAGCTCTTGAACAAAACCTTAATCCAATCGTTGTTGTAAATAAAATTGATAAGCCGTCAGCTC  
GTCCATCAGAGGTTGTTGATGAAGTTCTTGAACACTATTTATTGAGCTCGGTGCTGATGATGATCAACTAGATTTC  
CTGTTGTTTATGCTTCAGCTATCAATGGAACATCTTCAATGTCAGATGATCCTTCAGATCAAGAAAAACAATGG  
CACCGATTTTTGATACTATCATTGATCACATTCCAGCCCCAGTTGACAACCTCGGAAGAACCACTTCAATTCCAAG  
TTTCTCTTCTTGATTACAATGATTTTGTAGGACGTATTGGTATTGGACGTGTTTTCCGCGGGACTGTCAAAGTTG  
GAGATCAAGTTACTCTTTCAAACCTTGATGGTACAACATAAAACCTTCCGCGTAACAAAACCTTTTTGGTTTCTTTG  
GACTTGAACGTAAAGAAATCCAAGAGGCTAAAGCGGGTGATTTAATCGCTGTTTCTGGTATGGAAGATATCTTCG  
TTGGTGAGACAGTAACCTCCGACAGATGCTATTGAACCACTACCAGTTTTACGTATTGACGAGCCAACACTTCAAA  
TGACTTTCTTGGTGAATAATTCACCATTTGCAGGTCGGAAGGTAAATGGATTACGTCACGTAAGGTTGAAGAAC  
GTCTTTTAGCAGAATTACAAACAGACGTTTCTTTACGTGTTGACCCAACAGATTCGCCAGATAAATGGACGGTTT  
CAGGGCGTGAGAAATTACATTTATCTATCCTTATTGAAACAATGCGTCGTGAGGGATATGAACTTCAAGTATCAC  
GTCCAGAAGTTATCATCAAAGAAATTGATGGTGTTCATGCGAGCCGTTTGAGCGTGTTCAAATTGATACTCCAG  
AAGAATATCAGGGTGCTATTATCCAAAGTTTGTGAGAGCGTAAAGGTGATATGCTTGATATGCAGATGGTTGGTA  
ATGGTCAAACGCGTTTGATTTTCTTGATTCCCTGCACGTGGTTTGATTGGTTATTCAACAGAGTTTCTTTCAATGA  
CACGTGGATATGGTATCATGAATCATACTTTTGACCAGTATCTACCGGTTGTTCAAGGAGAAATTGGTGGTCGTC  
ATCGTGGTGCCCTTGTTTCTATTGAAAATGGTAAAGCAACTACATATTCAATTATGCGTATTGAAGAACGTGGGA  
CTATCTTTGTAAATCCAGGTATAGAAGTTTATGAAGGAATGATTGTTGGTGAGAATTCTCGTGATAATGACCTCG  
GAGTCAATATTACAACCTGCTAAACAAATGACAAATGTCCGTTTCAGCAACTAAAGATCAAA

**SEQ ID NO. 423 *Streptococcus pyogenes***

GTCTTAAAGACGGTATTGATTATTGGGATGGCAAAGTTAAACAAACAACCTAGTTAAGAGTAACGTGGAGTTAA  
GGGAATAAAGGCAGTCACTGTCTCAAAAACCTTAATTCCTTTTTTTGCTGTATCCAGACTTGCTGAAAGTCTGA  
AAATATTTACAATTGATTAAAACAGTTTTTTTAAACATTTTGTGTTATACTTATCTAGTTAAATATATTTACT  
TAGAGGAACAAATGACTAACTTAAGAAACGATATCCGTAACGTAGCGATTATTGCCACGTTGACCACGGAAAA  
CAACACTTGTAGATGAATTATTTAAACAATCCCATACTCTTGATGAGCGTAAAGAGCTTCAAGAGCGTGCCATGG  
ATTCCAATGACCTTGAAAAAGAACGTGGGATTACAATCCTTGCGAAAAATACGGCAGTAGCCTATAACGATGTTT  
GTATTAACATCATGGATACCCAGGACACGCGGACTTCGGTGGTGAAGTTGAACGTATCATGAAAATGGTTGACG  
GGGTTGTTCTTGTGTTGGATGCCTACGAAGGAACAATGCCCCAGACGCGTTTCGTATTGAAAAAAGCACTTGAGC  
AAAACCTTATCCCGATCGTTGTGGTGAACAAGATTGACAAACCTTCAGCTCGTCCAGCAGAAGTTGTAGATGAAG

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TGCTTGAATTATTTCATCGAACTTGGTGCCGATGATGAGCAATTGGAATTCCCAGTTGTTTACGCATCAGCTATTA  
ATGGAACATCATCATTATCAGATGACCCCTGCTGACCAAGAGCATACTATGGCACCGATCTTTGATACGATTATTG  
ATCATATTCCAGCGCCAGTTGATAATTCAGATGAGCCTTTGCAATCCAAGTGTCACCTTTTGGACTACAACGATT  
TCGTAGGTCGTATCGGTATCGGTTCGTGTTTTCCGTGGTACTGTTAAAGTGGGTGACCAAGTAACTCTTTCAAAC  
TTGATGGTACCCTAAAACTTCCGTGTTACAAAACTGTTTGGTTTCTTCGGTTTGGAACGTCGTGAAATTCAAG  
AAGCTAAAGCAGGTGACTTGATTGCTGTTTCAGGTATGGAAGATATCTTTGTTGGAGAAACCATACACCAACTG  
ACTGTGTGGAAGCTCTGCCAATTCTTCGTATTGATGAGCCAACACTTCAGATGACTTTCTTGGTCAATAACTCTC  
CTTTTGCAGGTCGTGAAGGTAAATGGATCACGTCACGTAAGGTTGAAGAACGTCTTTTAGCAGAATTGCAAACAG  
ACGTGTCACCTTCGTGTTGACCCAACAGATTCGCCAGATAAATGGACGGTTTCAGGGCGTGGAGAATTGCATTTAT  
CTATCCTCATTGAAACCATGCGCCGTGAAGGCTATGAACTTCAAGTATCACGTCCAGAAGTTATCATCAAAGAAA  
TTGATGGTGTCAAATGTGAACCGTTTGAGCGTGTTCAAATTGATACACCAGAAGAATATCAGGGTGCAATCATCC

**SEQ ID NO. 424 *Enterococcus faecalis***

CATCACGCAACGGAAATCGGACAAGCAAGCATGGGCGTGCGTATTAGCGGTTGTGCAGGTTTGGAAATTATTGCT  
ATGTTAAAAGGCAACCATCATGGCTATTTATCTAATCTAAGTCCTTGGGATTATGCAGCAGGCTTAGTACTTTG  
GAAGAATTTGGGTTTAAATACTCTGGTATTACAGGAAAACCATTAACCTTTTGCGGGTCGTGAATACTTTATTGCA  
GCAACTCCTGAAACCTATGATGAAGTATTTACCCGATATTTAAATGAATCGGAATAATCAAAGAAGAGCGTTGCT  
GAAAGGTAAGGCTCTTCCTCTTTTAAAGAGAAAAATTTGTAAAAAATGTCCTTGTTTTAGAAAAAGCCGAAT  
AATTTCTAAAACCTTTCATTATTTTTGCAGGCGAAAGCCTTTTTTTAATGAAAAAGTTTGCTATAATAAGCAGTC  
GGCTTTTATGGACTTAAGTAACATAAGCGTATATAGATAAGGAGCAATTAAATTGAAATACAGAGATGATATTCG  
TAACGTGGCAATTATCGCCACGTTGACCATGGTAAACAACCTTAGTAGATGAACTTTTAAACAATCTGACAC  
TTTAGATGGACACACACAATTACAAGAACGTGCAATGGATTCCAATGCACCTGAAAGTGAACGTGGAATTACTAT  
CTTAGCAAAAAATACAGCCGTAGATTATAACGGTACACGTATCAACATTCTAGATACACCAGGACACGCGGACTT  
CGGTGGTGAAGTAGAACGTATCATGAAAATGGTAGACGGTGTTGTTTTAGTTGTTCGATGCGTATGAAGGAACAAT  
GCCTCAAAACACGTTTCGTATTGAAAAAGCATTAGAACAAAAAGTAACACCAATCGTGGTTGTTAACAAAATTGA  
CAAACCTTCTGCTCGTCCTGAACACGTAGTAGATGAAGTTTTAGAGTTATTCATCGAATTAGGTGCAGACGACGA  
TCAATTAGATTTCCAGTTGTTTATGCTTCTGCTTTAAACGGAACCTCAAGTGAATCAGATGATCCAGCAGATCA  
AGAGCCAACAATGGCCCCAATTTTTGATAAAATTATTGAACATGTGCCAGCTCCAGTTGACAATTCAGACGAACC  
ACTTCAATTCCAAGTCTCATTACTAGACTACAACGATTACGTTGGACGTATTGGGATTGGCCGTGTGTTCCGTGG  
CACAATGAAAGTCGCGGACCAAGTTGCGTTGATGAAATTAGATGGCAGCGTGAAAAATTTCCGTGTAACGAAAAT  
TTTAGGTTTCTTTGGCTTACAACGTGTGGAATTGATGAAGCAAAAGCGGGCGATTAAATTGCCGTTTCTGGAAT  
GGAAGACATTTTCGTTGGGGAACAGTTGTAGATGTTTACAATCAAGAAGCATTACCAATTCTACACATTGATGA  
GCCAACCTTACAAATGACTTTCTTAGTTAACAATTCTCCATTTGCGGGACGTGAAGGAAAATACATCACCGCTCG  
TAAATCGAAGAACGTTAATGGCTGAGTTACAAACAGACGTATCTTTACGTGTTGATCCAATTGGCCCAGATTC  
TTGGACTGTATCAGGTTCGTGGCGAATTGCATTTATCAATTTTAAATTGAAAACATGCGTCGTGAAGGCTATGAATT  
ACAAGTTTCTCGTCCAGAAGTTATTGAACGTGAAATTGATGGAGTTAAATGTGAACCATTGTAACGTGTTCAAAT  
TGACACACCTGAAGA

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**SEQ ID NO. 425 *Lactococcus lactis***

CGAAAAAGCAAGTTAAATATGTTGTAAATAATGGTGTTACATTAGATAAATACTAGTGGTGGGCCTAATTTGGCTG  
CACCTGTGACGGTGGATAGTCAGGTAATTTGCAACGATAAAGGTACGATTATGGGTGTAAGGACCTATACAGCAG  
ATTTAAGCCAAGCAGAAGTAGTTAAAAAAGTGGGTAATTTGAATGCAATGTCCTTTGGAGAATTTGGGGGTACAA  
AAGTTTTTGTGCTGCCAGCCAAAATCAGACAAATTCAGATAAGACTTATTCTGTTACGTTTAAACTGAATATAAATT  
GGATAGTATCTAATGGCTATGCTTCGCTAACAAAAGTAACAGGTGGCTATGGTTCTTGCAATTGACCATGTTTATG  
TTGCTAATTCTAGTGTTACTACTGCAACGAATGGTCAGATTAAAGGTTCAAGTGGTTATACTCAACAAGTTGATG  
ACAAATCAGAAGGGAATAGTTTATCGTGGTCAATTACGCGAAACTATAAACCTGTAAAAGTTCCAGCAAGTGGGG  
CAAAATGTAGGAGCTACGTATTTTGCCACACTTAAACGGGGAAATAGTACATGGAAATTCCAAACAACAAATAGAG  
CTTATTAAGTGGGAGGAAGTGAATGAATATAAAAGGCATAAAAAATTTGGCAAGTATTTCTTGCAATTCATCATTT  
GGATAGGAACCATGTTTCTTCCTGCAACGGTAAATCAGGCTAAATTGAATACGAATTTTGACTATAAAAAAAGTC  
GAGAAAAATTTCTTTTATTTTCTTTTTCATCAAGTCCCTTTTTATAGTTTCATTTTGGGATTGGTGTTGCTTATAT  
CACTTTTTCTCATTTTATAGGAAAATAAATTTTAGTGTCTATTTTTCTTTTGCTAGTCTTATTTTTTACATTAGTT  
TCTTAGTTATAGCTTTTCCGTCCTATGATTATTTTAAATCATAGTTTATCTGGGAATACTTTTGGGGCTGAACTTT  
CTATCTTTCTAACCTTTTATGGAGCTGGATATATTATGCTGTTCTATTTGGTTTAGTTGCTTTTCTTTTACTCT  
TTCTCTACAGTTTAAAGAATAAAAGAATGTTAACAACATAATCATTTTTACTGATTTTATTAATTATAAAAAAATA  
AAGAACTCCTTAGAAATTTTCTTTGGGGTTTTCATTTTGAAGTAAAAAATCTTTGTTAGGCTTGTAACGTG  
TGCATTTACAGCTTTTAGAAAAGTGTGCTATAATGGGTAGATATATACGAAAGTAAGGTATGATAAAATTGACT  
AAATTACGCGAAGATATTAGAAACGTCGCTGTTATTGCCACGTTGACCATGGTAAAACCTACATTGGTTGACGAA  
CTCTTAAAACAATCTCAAACGTTGGATGCTCGTAAAGAATTAGCTGAACGTGCGATGGACTCAAATGCACTTGAG  
CAAGAACGTGGGATTACTATCCTTGCCAAAAATACAGCAGTTGAATATAACGGAACCTCGTATCAACATCTTGAC  
ACACCAGGTCACGCGGACTTCGGTGGAGAAGTTGAACGTATTATGAAAATGGTTGATGGGGTTGTCCCTCGTTGTC  
GATGCTTATGAAGGAACAATGCCTCAAACACGTTTTGTTTTGAAA

**Figure 18 represents sequences amplified with molecular marker VI (pgi) from various Gram-negative bacteria (SEQ ID NOs 426-430).**

**SEQ ID NO. 426     *Citrobacter freundii***

ATCTGGTACAACAATTTCTTCGGTGCTGAAACCGAAGCGATTCTGCCGTACGACCAGTATATGCACCGTTTCGCG  
GCCTACTTCCAGCAGGGCAATATGGAATCCAATGGTAAATACGTTGACCGTAACGGCAATGCGGTGGATTACCAG  
ACAGGCCCAATCATCTGGGGTGAGCCGGGTACTAACGGTCAGCATGCGTTCTACCAACTGATTCATCAGGGTACC  
AAAATGGTTCCGTGCGATTTTCATCGCTCCGGCAATCACCCACAACCCGCTGTGCGGATCACCATCCGAAACTGCTG  
TCTAACTTCTTCGCTCAGACCGAAGCGCTGGCTTTTGGTAAATCCCGCGAAGTGGTTGAGCAGGAATACCGCGAC  
CAGGGTAAAGATCCGGCAACGCTTGACCACGTTGTGCCGTTCAAAGTGTTTGAAGGTAACCGTCCAACCTAACTCC  
ATCCTGCTGCGCGAAATCACACCGTTTCAGCCTGGGTGCGCTGATTGCGCTGTACGAGCACAAAATCTTCACTCAG  
GGCGCGATCCTGAATATCTTCACCTTTGACCAGTGGGGCGTTGAGCTGGGCAAACAGCTGGCGAATCGCATTTCTG  
CCAGAGCTGAATGATGATAAAGAAATCACCAGCCATGATTGCTCAACTAACGGTTTGATTAACCGCTATA

**SEQ ID NO. 427     *Klebsiella pneumoniae***

ATCTGGTACAACAACCTTCTTCGGTGCGGAAACCGAAGCGATTCTGCCGTACGACCAGTACATGCACCGCTTTGCC  
GCTTACTTCCAGCAGGGCAACATGGAGTCCAACGGTAAGTATGTTGACCGTAACGGCCACGCGGTAGACTACCAG  
ACTGGCCCAATCATCTGGGGTGAGCCGGGCACCAACGGTCAGCACGCGTTCTACCAGCTGATCCACCAGGGCACC  
AAAATGGTACCGTGCGATTTTCATCGCTCCGGCTATCACCCACAACCCGCTGTCTGACCACCATCAGAACTGCTG  
TCTAACTTCTTCGCCCAGACCGAGGCCCTGGCCTTTGGTAAATCCCGCGAAGTGGTTGAGCAGGAATATCGCGAT  
CAGGGTAAAGACCCGGCGACCCTGGAGCACGTGGTGCCGTTCAAAGTGTTTGAAGGTAACCGCCCGACTAACTCC  
ATCCTGCTGCGCGAGATTACCCCGTTTCAGCCTCGGGGCGCTGATTGCCCTGTACGAGCACAAAATCTTCACCCAG  
GGCGCGATCCTCAACATCTTCACCTTTGACCAGTGGGGCGTTGAGCTGGGCAAACAGCTGGCTAACCGCATCCTG  
CCGGAGCTGAAAGACGGCAGCGAAGTTAGCAGCCACGACAGCTCTACTAACGGCCTGATTAACCGCTATA

**SEQ ID NO. 428     *Klebsiella oxytoca***

ATCTGGTACAACAACCTTCTTCGGCGCTGAAACCGAAGCGATTCTGCCGTACGACCAGTATATGCACCGCTTTGCC  
GCCTACTTCCAGCAGGGCAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGCAACGCCGTGGATTACCAG  
ACGGGCCCCGATCATCTGGGGCGAGCCGGGCACCAACGGTCAGCACGCGTTCTATCAGCTGATTCACCAGGGGACC  
AAAATGGTGCCGTGCGATTTTATCGCTCCGGCGATTACGCATAACCCGCTGTCTGACCATCATCCGAAGCTGCTG  
TCTAACTTCTTTGCGCAGACCGAAGCGCTGGCGTTTGGTAAATCCCGCGAAGTGGTTGAACAGGAATATCGCGAT  
CAGGGTAAAGATCCCGCGACGCTGGAACACGTGGTGCCGTTCAAAGTGTTTGAAGGCAACCGCCCGACTAACTCC  
ATCCTGCTGCGTGAAATCACGCCGTTTCAGTCTGGGCGCGCTGATTGCCCTGTATGAACATAAGATTTTCACCCAG  
GGCGTGATTATGAACATCTTCACCTTCGACCAGTGGGGCGTTGAGCTGGGCAAACAGCTGGCGAACCGCATCCTG  
CCGGAGCTGAAGGATGGTTCTGAAGTCAGCAGCCACGACAGCTCCACTAACGGCCTGATTAACCGCTATA

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**SEQ ID NO. 429     *Escherichia coli***

ATCTGGTACAACAACCTTCTTCGGGGCTGAAACCGAAGCGATTCTGCCATACGACCAGTACATGCACCGTTTTGCG  
GCCTACTTCCAGCAGGGCAACATGGAATCCAACGGTAAATACGTTGACCGTAACGGTAACGCTGTGGATTACCAG  
ACTGGCCCAATCATCTGGGGCGAGCCAGGCACTAACGGCCAGCATGCGTTCTATCAGCTGATCCACCAGGGCACC  
AAAATGGTTCCGTGCGATTTTCATCGCCCCGGCCATTACCCATAACCCGCTGTCAGACCACCATCCGAAGCTGCTG  
TCTAACTTCTTCGCACAGACTGAAGCGCTGGCGTTTCGGTAAGTCTCGTGACGTGGTTGAGCAGGAATACCGCGAC  
CAGGGTAAAGATCCGGCCACGCTGGACCACGTTGTGCCGTTCAAAGTGTTTGAAGGCAACCGTCCAACCAACTCC  
ATCCTGCTGCGCGAAATTACGCCGTTTCAGCCTGGGTGCGCTGATTGCCCTGTACGAGCATAAGATCTTCACTCAG  
GGCGCTATCCTGAACATCTTCACCTTTGACCAGTGGGGCGTTGAGCTGGGTAAACAGCTGGCAAACCGTATCCTG  
CCTGAACTGGGTGACGATAACGCGATTAACAGCCACGACAGCTCCACAAATGGTCTGATTAACCGCTATA

**SEQ ID NO. 430     *Serratia marcescens***

AAGCACTTTGCCGAAACGCCGGCGGAGAAAAACCTGCCGGTGTTGCTGGCGCTGATCGGTATTTGGTACAACAAC  
TTCTTTGGCGCCGAAACCGAAGCCATTCTGCCGTACGATCAGTACATGCACCGTTTTGCCGCTTACTTCCAGCAG  
GGCAAGATGGAATCCAACGGCAAGTACGTGATCGCAACGGCAACCCGGTGGATTACCAGACCGGTCCCGTCATT  
TGGGGCGAGCCGGGCACCAACGGCCAGCATGCGTTCTATCAGTTGATCCACCAGGGCACCAAGCTGGTGCCGTGC  
GATTTTCATCGCGCCGGCCATCAGCCATAACCCGCTGGGCGATCATCACGCCAAACTGCTGTCCAACCTTCTTCGCT  
CAGACCGAAGCGCTGGCGTTTCGGCAAGTCGCTGGAAGTGGTGAAGCCGAGTTTCGCGGCGCAGGGCAAACTCCT  
GAGCAGGTCAAGCACGTGGCGCCGTTCAAGGTGTTGAAGGCAACCGGCCG

Figure 19 represents sequences amplified with molecular marker V (carB) from various Gram-negative bacteria (SEQ ID NOs 431-442).

**SEQ ID NO. 431     *Neisseria gonorrhoeae***

TTCGCCCTTCGACCTTATGACTGACCCTGAAATGGCGGATGTTACCTACATCGAACCGATTATGTGGCAGACGGT  
GGAGAAGATTATCGCCAAGGAGCGGCCCGATGCGATTCTGCCCACGATGGGCGGTGAGACCGCGCTGAACTGTGC  
GCTGGATTTGGCGCGTAACGGCGTGCTGGCGAAATACAATGTGAGTTAATCGGCGCAACGGAAGACGCGATCGA  
CAAGGCGGAAGACCGCGGCCGCTTTAAAGAAGCGATGGAAAAATCGGCCTCTCTTGCCCGAAATCTTTTGTCTG  
CCACACCATGAACGAAGCCTTGGCGGCGCAAGAACAGGTCGGCTTTCCGACGCTGATTTCGTCCGTCTTTCACGAT  
GGGCGGTTCTGGGCGGCGGCATTGCCTACAATAAGGATGAGTTTTTGGCGATTTGCGAACCGGTTTCGATGCGTC  
GCCTACGCATGAGCTGCTGATTGAGCAGTCTGTGCTCGGCTGGAAAGAGTACGAGATGGAAGTGGTGCGCGATAA  
GGCGGACAACATGCATCATCTGTTCGATTGAAAACCTTCGACCCGATGGGCGTTTCATACGGGCGACTCGATTAC  
GGTTGCGCCGGCGCAAACGCTGACGGACAAGGAATACCAAATCATGCGCAACGCTTCGTTGGCGGTATTGCGCGA  
AATCGGCGTGGACACGGGCGGCTCGAACGTGCAGTTTGGCGTGAACCCTGAAAACGGCGAGATGATTGTGATCGA  
GATGAACCCGCGCGTGAGCCGTTTCGTCCGCGCTGGCTTCCAAAGCAACGGGCTTCCCGATTGCGAAGGTGGCGGC  
GAAGCTGGCGGTTCGGCTTTACGCTGGACGAGTTGCGCAACGACATCACGGCGGCCGACGCCCCGCGTCGTTCGA  
GCCTTCCATCGACTATGTGGTAACCAAAATCCCGCGTTTCGCGTTTGAAAAATTCCCCGCCGACGACCGCCCT  
GACCACGCAGATGAAATCAGTAGGCGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTGGATCCGA  
GCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGCGTCACCTAAAT

**SEQ ID NO. 432     *Serratia marcescens***

TTTNGNATTCGCCCTTCGACGATTATGACTGACCCGGCAAATGGCGGATGCAACCTACATCGAGCCAATTCCTG  
GGAAGTGGTACGTAAAATCATCGAGAAAGAGCGTCCGGATGCGGTTCTGCCGACCATGGGTGGCCAGACTGCGCT  
GAACTGTGCGCTGGAGCTGGAGCGTCAGGGCGTGCTGGAAGAGTTCGGCGTGACCATGATTGGTGCGACCGCCGA  
CGCGATTGATAAAGCAGAAGACCGTCGTCGCTTCGACGTGGCGATGAAAAAATCGGCCTCGACACCCGCGCGTT  
CCGGTATCGCTCACAACATGGAAGAGGCGTGGCCGTTGCGGCTGAAGTGGGTTATCCGTGCATCATCCGTCCTT  
CCTTACCATTGGGCGGCACCGGCGGCGGTATCGCCTACAACCGCGAAGAGTTTGAAGAGATTTGCGAGCGCGGCC  
TGGATCTCTCCCCAACCAAGAGCTGCTGATTGATGAATCGCTGATTGGCTGGAAAGAGTACGAGATGGAAGTGG  
TGCGTGATAAAAACGACAACATGCATCATCTGCTCCATCGAAAACCTTCGATGCGATGGGTATCCACACCGGCG  
ACTCCATTACCGTTGCGCCAGCGCAAACGCTGACCGACAAAGAGTACCAAATCATGCGTAACGCATCGATGGCGG  
TACTGCGTGAAATCGGCGTCGAAACCGGTGGTTCTAACGTGCAGTTCTCGGTGAACCCGAAAACCGGCCGCTCTGA  
TTGTTATCGAAATGAACCCGCGCGTGTCCCGCTCCTCCGCGCTGGCTTCTAAAGCGACCGGCTTCCCGATTGCGA  
AGGTGGCGGCGAAACTGGCGGTTCGTTACACCCTTGACGAGCTGATGAACGATATCACGGGGGGCCGACGCGCTG  
CGTCCTTCGAACCGTCTATCGACTACGTTGTGACCAAAATTCACGCTTCAACTTCGAGAAATTCGCTGGCGCGA  
ACGACCGTCTGACCACCCNGTTGAAATCCTGTAAAAAGAAGTAAGGGGTNACTCNAAAAA

**SEQ ID NO. 433     *Citrobacter freundii***

TCGCCCTTCGACTATTATGACTGACCCGAAATGGCCGATGCCACCTACATCGAGCCGATTCACTGGGAAGTGGT  
ACGCAAAATCATTGAGAAAGAGCGCCCGGATGCGGTGCTGCCAACCATGGGCGGTGAGACGGCGCTGAACTGTGC

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GCTGGAGCTGGAACGCCAGGGCGTACTGGCTGAATTCGGCGTGACCATGATTGGCGCAACGGCGGATGCCATTGA  
TAAAGCGGAAGACCGTCGTCGCTTTGATATCGCGATGAAGAAAATTGGTCTCGACACCGCGCGCTCTGGCATCGC  
TCACACCATGGAAGAAGCGCTGGCGGTTGCTGCTGACGTGGGCTTCCCGTGCATCATCCGACCGAGCTTCACCAT  
GGGCGGCACCGGCGGCGGTATCGCTTATAACCGTGAAGAGTTCGAAGAGATTTCGAACGCGGTCTGGACCTTTC  
CCCAACCAACGAGCTGCTGATTGATGAATCGCTGATTGGCTGGAAAGAGTACGAGATGGAAGTGGTGCGTGATAA  
AAACGACAACCTGCATCATCGTCTGCTCCATCGAAAACCTTCGACGCGATGGGCATCCATACCGGTGACTCCATCAC  
CGTAGCACCTGCCCAGACGCTGACCGACAAAGAATATCAAATCATGCGTAACGCCTCGATGGCGGTACTGCGTGA  
AATCGGCGTGGAAACCGGCGGTTCTAACGTCCAGTTTGGCGTAAACCCGAAAAACGGTCGCGCTGATTGTCATCGA  
GATGAACCCGCGCGTATCCCGCTCCTCGGCGCTGGCGTCCAAAGCTACCGGCTTCCCGATTGCGAAAGTCGCCGC  
CAAGCTGGCCGTAGGTTACACCTCGACGAACTGATGAACGACACCACCGCGGCCGTACTCCGGCCTCGTTTGA  
GCCGTCCATCGACTACGTTGTGACGAAAAATTCCACGCTTCAACTTCGAGAAATTTCGTTGGTGCTAATGACCGTCT  
GACCACGCAGATGAAATCAGTAGGAGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTGGATCCGA  
GCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGCGTCACCTAAATAGCTGGCG

**SEQ ID NO. 434     *Enterobacter aerogenes***

TTNCGNATTCGCCCTTCGACGATTATGACTGATCCGGAAATGGCCGATGCGACCTACATCGAGCCGATTCACTGG  
GAAGTAGTACGCAAGATTATTGAAAAAGAGCGCCCGGACGCGGTGCTGCCAACGATGGGCGGTGACAGGCGCGTG  
AACTGCGCGCTGGAGCTGGAGCGTCAGGGCGTGTTGGAAGAGTTCGGCGTGACTATGATTGGTGCGACCGCCGAT  
GCGATTGATAAAGCAGAAGACCGCCGTCGTTTCGACGTAGCGATGAAGAAAATTGGTCTGGAAACCGCGCGTTCC  
GGTATCGCACACAGATGGAAGAAGCGCTGGCGGTTGCCNGTACTGGGCTTCCCGTGCATTATTNGNCCCATCC  
TTTACCATGGGCGGTAGCGGCGGCGGTATCGCTTATAACCGCGAAGAGTTGAAGAAATTTGCGCCCGCGGTCAGG  
ATCTCTCCCCAACCAAGAGCTGCTGATTGATGAGTCGCTGATCGGCTGGAAAGAGTACGAGATGGAAGTGGTG  
GTGATAAAAACGACAACCTGCATCATCGTCTGCTCTATCGAAAACCTTTGATGCGATGGGCATCCATACCGGTGACT  
CCATCACTGTGCGCCAGCCCCAACGCTGACCGACAAAGAATATCAAATCATGCGTAACGCCTCGATGGCGGTGC  
TGCGTGAAATCGGCGTTGAAACCGGTGGTTCCAATGTCCAGTTTGGCGGTGAACCCGAAAAACGGTCGCGCTGATTG  
TTATCGAAATGAACCCACGCGTGTCGCTTCTTCGGCGCTGGCGTCGAAAGCGACCGGTTTCCCGATTGCTAAAG  
TGGCGGCGAAACTGGCGGTGGGTTACATCCTCGACGAACTGATGAACGACATCACTGGCGGACGTACTCCGGCCT  
CCTTCGAGCCGTCCATCGACTATGTGGTTACTAAAATTTCCTCGCTTCAACTTCGAAAAATTCGCTGGTGCTAACG  
ACCGTCTGACCACTCAGATGAAATCCGTAGGTGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTG  
GATCCGAGCTCGGTACCAAGCTTGATGCATAGNCTTGAGTATTCTAACGCGTCACCTAAATAGGCTGGCGTAANC

**SEQ ID NO. 435     *Enterobacter cloacae***

ATTCGCCCTTCGACGATTATGACTGATCCGGAAATGGCGGATGCAACCTACATCGAGCCAATTCCTGGGAAGTG  
GTACGTAAAATCATCGAGAAAGAGCGTCCGGATGCGGTTCTGCCGACCATGGGTGGCCAGACTGCGCTGAACTGT  
GCGCTGGAGCTGGAGCGTCAGGGCGTGCTGGAAGAGTTCGGCGTGACCATGATTGGTGCGACCGCCGACGCGATT  
GATAAAGCAGAAGACCGTCGTCGCTTCGACGTGGCGATGAAAAAATCGGCCTCGACACCGCGCGTTCCGGTATC  
GCTCACAACATGGAAGAGGCGCTGGCCGTTGCGGCTGAAGTGGGTTATCCGTGCATCATCCGTCTCTTCCCTTACC  
ATGGGCGGCACCGGCGGCGGTATCGCTACAACCGCGAAGAGTTTGAAGAGATTTCGAGCGCGGCGCTGGATCTC  
TCCCCAACCAAGAGCTGCTGATTGATGAATCGCTGATTGGCTGGAAAGAGTACGAGATGGAAGTGGTGCGTGAT  
AAAAACGACAACCTGCATCATCGTCTGCTCCATCGAAAACCTTCGATGCGATGGGTATCCACACCGGCGACTCCATT

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ACCGTTGCGCCAGCGCAAACGCTGACCGACAAAGAGTACCAAATCATGCGTAACGCATCGATGGCGGTACTGCGT  
GAAATCGGCGTCGAAACCGGTGGTTCTAACGTGCAGTTCTCGGTGAACCCGAAAACCGGCCGTCTGATTGTTATC  
GAAATGAACCCGCGCGTGTCCCGCTCCTCCGCGCTGGCTTCTAAAGCGACCGGCTTCCCGATTGCGAAGGTGGCG  
GCGAAACTGGCGGTGCGTTACACCTTGACGAGCTGATGAACGATATCACCGGGGGCCGCACGCCTGCGTCCTTC  
GAACCGTCTATCGACTACGTTGTGACCAAAATTCACGCTTCAACTTCGAGAAATTCGCTGGCGCGAACGACCGT  
CTGACCACCCAGATGAAATCAGTCGGCGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTGGATCC  
GAGCTCGGTACCAAGCTTGATGCATAGNCTTGAGTATTNCTAACGCGTCACCTAAATNGTCTGGCGAA

**SEQ ID NO. 436**     *Morganella morganii*

TTGGAGTCGCCTCTTCGACGATTATGACTGATCCGGCAAATGGCGGATGCGACTTACATCGAGCCGATTCACTGG  
GAAGTGGTGCGCAAATCATCGAAAAAGAGCGCCCGGATGCCGTTCTGCCGACCATGGGCGGACAAACCGCGCTG  
AACTGTGCGCTGGATCTGGAACGTCACGGCGTGCTGGCAGAGTTCCGGCGTCGAAATGATTGGCGCGACAGCAGAT  
GCGATTGATAAAGCCGAAGATCGCCGCCGTTTCGATATCGCGATGAAAAAATCGGTCTGGATACAGCGCGTTCC  
GGTATCGCACACACCATGGAAGAAGCGTTTGCGGTCGCTGAAGATGTCGGATTCCCTGCATCATTCGTCCTTCAT  
TTACTATGGGCGGCACGGGGGGCGGTATCGCTTATAACCGTGAAGAATTTGAAGAAATTTGTAAGTGGATTAG  
ATTTATCACCGACTAACGAGTTATTGATTGATGAATCACTTATTGGTTGGAAAGAGTATGAAATGGAGGTGGTGC  
GCGATAAAAACGACAACGTCATTATTGTCTGCTCTATCGAAAACTTTGATGCGATGGGTATCCATACTGGAGATT  
CGATTACGGTTGCACCAGCTCAAACGTTAACGGATAAAGAGTACCAAATTATGCGTAATGCCTCGATGGCAGTCT  
TACGCGAAATTTGGTGTGAAACAGGTGGCTCTAACGTTTCAGTTTGCTGTTGACCCAAAAACAGGACGCTTAATTG  
TTATTGAGATGAATCCACGTGTTTCACGTTTCATCAGCGCTAGCGTCAAAAGCGACAGGATTTCCCTATCGCTAAAA  
TAGCGGCAAAACTGGCTGTGGGTTATACCCTTGATGAGTTAATGAATGATATCACTGGCGGTAGAACGCCTGCCT  
CTTTTGAGCCTTCTATCGATTATGTGGTAACAAAAATTCCTCGATTTAATTTTGAAAAATTCGAGGTACTAATG  
ACAGATTAACCACACAAATGAAATCCGTAGGCGAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTGG  
ATCCGAGCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGCGTCACCTAAATA

**SEQ ID NO. 437**     *Escherichia coli*

CACGACGCCGCGCCGTTGTTTCGACCACTTTATCGAGTTAATTGAGCAGTACCGTAAAACCGCTAAGTAATCAGGA  
GTAAAAGAGCCATGCCAAAACGTACAGATATAAAAAGTATCCTGATTCTGGGTGCGGGCCCCGATTGTTATCGGTC  
AGGCGTGTGAGTTTACTACTCTGGCGCGCAAGCGTGTAAGCCCTGCGTGAAGAGGGTTACCGCGTCATTCTGG  
TGAATCCAACCCGGCGACCATCATGACCGACCCGGAATGGCTGATGCAACCTACATCGAGCCGATTCACTGGG  
AAGTTGTACGCAAGATTATTGAAAAAGAGCGCCCGGACGCGGTGCTGCCAACGATGGGCGGTGACAGCGCGCTGA  
ACTGCGCGCTGGAGCTGGAACGTCAGGGCGTGTTGGAAGAGTTCGGTGTCACCATGATTGGTGCCACTGCCGATG  
CGATTGATAAAGCAGAAGACCGCCGTCGTTTCGACGTAGCGATGAAGAAAATTTGGTCTGGAAACCGCGCGTTCCG  
GTATCGCACACACGATGGAAGAAGCGCTGGCGGTTGCCGCTGACGTGGGCTTCCCGTGCATTATTCGCCCATCCT  
TTACCATGGGCGGTAGCGGCGGCGGTATCGCTTATAACCGTGAAGAGTTTGAAGAAATTTGCGCCCGCGGTCTGG  
ATCTCTCTCCGACCAAAGAGTTGCTGATTGATGAGTCGCTGATCGGCTGGAAAGAGTACGAGATGGAAGTGGTGC  
GTGATAAAAACGACAACGTCATCATCGTCTGCTCTATCGAAAACTTCGATGCGATGGGCATCCACACCGGTGACT  
CCATCACTGTGCGCCAGCCCAAACGCTGACCGACAAAGAATATCAAATCATGCGTAACGCCTCGATGGCGGTGC  
TGCGTGAAATCGGCGTTGAAACCGGTGGTTCCAACGTTTCAGTTTGCGGTGAACCCGAAAAACGGTCGTCTGATTG  
TTATCGAAATGAACCCACGCGTGTCCCGTTCTTCGGCGCTGGCGTCGAAAGCGACCGGTTTCCCGATTGCTAAAG



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TGGCGGCGAAACTGGCGGTGGGTTACACCCTCGACGAACTGATGAACGACATCACTGGCGGACGTACTCCGGCCT  
CCTTCGAGCCGTCCATCGACTATGTGGTTACTAAAATTCCTCGCTTCAACTTCGAAAAATTCGCCGGTGCTAACG  
ACCGTCTGACCACTCAGATGAAATCGGTTGGCGAAGTGATGGCGATTGGTCGCACGCAGCAGGAATCCCTGCAAA  
AAGCGCTGCGCGGCCTGGAAGTCGGTGCGACTGGATTGACCCGAAAGTGAGCCTGGATGACCCGGAAGCGTTAA  
CCAAAATCCGTGCGGAACTGAAAGACGCAG

**SEQ ID NO. 438 *Proteus mirabilis***

TCTTTTCGNATTCGCCCTTCGACTATTATGACTGATCCTGAAATGGCAGATGCCACTTATATTGAGCCTATTCATT  
GGCAAGTGGTCAGAAAGATTATTGAGAAAAGAGCGCCCTGATGCCATATTACCGACAATGGGCGGACAAACGGCAT  
TAAACTGTGCCTTAGAATTAGAGCGTCAAGGGGTGTTAACTGAATTTGGCGTAACAATGATAGGTGCAACGGCTG  
ATGCTATTGATAAAGCGGAAGATAGACAACGCTTTGATAAAGCGATGAAAAAATTTGGTCTGGATACGGCTCGTT  
CAGGCATCGCTCATACTATGGACGAAGCATTTGCAGTGGCTGAGCAAGTGGGTTTCCCTTGTATTATTTCGCCCTT  
CATTTACTATGGGGGGAACGGGAGGCGGGATCGCCTATAATCGTGAGGAATTTGAAGAAATTTGTACTCGAGGTT  
TAGATTTATCACCGACAAATGAACTATTAATTGATGAATCATTAAATTGGCTGGAAAGAGTATGAAATGGAAGTGG  
TGCGCGATAAAATGATAACTGCATTATCGTTTGCTCCATTGAAAACCTTTGATGCGATGGGGATCCATACCGGTG  
ACTCTATCACGGTTGCTCCAGCGCAAACGCTAACAGACAAAGAATATCAAATTATGCGTAATGCCTCGATGGCAG  
TATTACGCGAGATTGGGGTTGAAACCGGTGGCCCCAATGTGCAATTTGCCGTTGATCCTAAACAGGGCGTTTAA  
TTGTTATTGAAATGAACCCTCGTGTTTCTCGCTCATCAGCATTAGCGTCAAAAGCAACAGGTTTCCCAATTGCAA  
AAGTCGCGGCAAACTTGCAGTAGGTTATACCCTCGATGAGTTGATGAATGATATCACTGGAGGAAGAACCCAG  
CCTCTTTTGAACCTTCTATTGATTATGTAGTGACTAAAATCCCTCGCTTTAACTTTGAAAAATTTGCCGGTACCA  
ATGACCGTTTAAACCACGCAAATGAAGTCCGTAGGCGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTA  
GTGGATCCGAGCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGAGTCACCTAAATGCTGGCG

**SEQ ID NO. 439 *Proteus vulgaris***

ATTCGCCCTTCGACGATTATGACTGATCCTGAAATGGCGGATGCCACCTACATCGAGCCTATTCATTGGCAAGTC  
GTCAGAAAAATTATTGAAAAAGAGCGCCCTGATGCGATTTTGCCAACAATGGGGGGGCAACCGGCATTAAATTGC  
GCATTAGAATTAGAACGTCAAGGTGTGTTAGCTGAATTCGGTGTGACCATGATTGGTGCTACGGCCGATGCTATC  
GATAAAGCAGAAGATAGACAACGCTTTGATAAAGCAATGAAAAAATCGGCTTAGGCACAGCTCGCTCAGGTATT  
GCTCATAATCTAGAAGAAGCTTTTGCCGTCGCTGAAGATGTCGGATTCCCTTGATCATTTCGTCCCTTCATTTACT  
ATGGGCGGCACGGGGGGCGGTATCGCTTATAACCGTGAAGAATTTGAAGAAATTTGTACTCGTGGATTAGATTTA  
TCACCGACTAACGAGTTATTGATTGATGAATCACTTATTGGTTGGAAAGAGTATGAAATGGAGGTGGTGCGCGAT  
AAAAACGACAACCTGCATTATTGTCTGCTCTATCGAAAACCTTTGATGCGATGGGTATCCATACTGGAGATTTCGATT  
ACGTTTGCACCAGCTCAAACGTTAACGGATAAAGAGTACCAAATTATGCGTAATGCCTCGATGGCAGTCTTACGC  
GAAATTGGTGTTGAAACAGGTGGCTCTAACGTTTCAGTTTGCTGTTGACCCAAAACAGGACGCTTAATTGNTATTG  
AGATGAATCCNCGTGTTTACGTTTCATCAGCGCTAGCGTCAAAGCGACAGGATTTCCCTATCGCTAAAAATAGCGG  
CAAACTGGCTGTGGGTTATACCCTTGATGAGTTAATGAATGATATCACTGGCGGTAGAACGCCTGCCTCTTTTG  
AGCCTTCTATCGATTATGTGGTAACAAAATTCCTCGATTTAATTTTGAAAAATTCGCAGGTACTAATGACAGAT  
TAGCCACACAAATGAAATCCGTTGGCGAAGTAAGGGCGAATTCCAGCACACTGGCGGCCGTTACTAGTGGATCCG  
AGCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGCGTCACCTAAATGGCTGGCG

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**SEQ ID NO. 440 *Neisseria meningitidis***

CCAAACGTACCGACCTAAAATCCATCCTTATCATCGGCGCCGGCCCTATCGTTATCGGTCAGGCCTGCGAATTTG  
ACTATTCGGGCGCACAGGCCTGCAAGGCTTTGCGTGAAGAAGGCTATAAAGTCATTTTGGTGAATTTCCAACCCCG  
CCACGATTATGACCGACCCTGAAATGGCGGATGTTACCTACATCGAGCCGATTATGTGGCAGACGGTGGAGAAGA  
TTATCGCCAAGGAGCGGCCTGATGCGATTCTGCCCACGATGGGCGGTCAGACCGCGCTGAACTGTGCGCTGGATT  
TGGCACGCAACGGCGTGCTGGCAAATACAATGTGAGCTGATTGGGCGGACGGAAGACGCGATCGACAAGGCGG  
AAGACCGCGGCCGCTTTAAAGAAGCGATGGAAAAAATCGGTTTGTCTTGCCCGAAATCTTTTGTCTGCCACACGA  
TGAACGAAGCTTTGGCGGCGCAGGAGCAGGTCGGCTTCCCGACGCTGATTTCGTCCTTCTTTACGATGGGCGGTT  
CGGGCGGCGGCATTGCCTACAATAAAGACGAGTTTTTGGCGATTTGCGAACGCGGTTTCGATGCGTCGCCCACGC  
ACGAGCTGCTGATTGAGCAGTCCGTCCTCGGCTGGAAAGAGTACGAGATGGAGGTGGTGCGGATAAGAACGATA  
ACTGCATCATCATTTGCTCGATTGAAAACCTTCGACCCGATGGGCGTGATACGGGCGACTCGATTACGGTTGCGC  
CGGCGCAAACATTGACAGACAAAGAATACCAAATCATGCGTAATGCTTCGTTGGCAGTATTGCGCGAAATCGGCG  
TGGACACGGGTGGCTCAAACGTGCAGTTTGGCGTGAACCCTGAAAACGGCGAGATGATTGTGATTGAGATGAACC  
CGCGCGTGAGCCGTTTCATCCGCGCTGGCTTCCAAAGCGACGGGCTTCCCGATTGCGAAGGTGGCGGCGAAACTGG  
CGGTCGGCTTTACGCTGGACGAGTTGCGCAACGACATCACGGGCGGTGCGACGCCCCGCGTCGTTTCGAGCCTTCGA  
TTGATTATGTGGTAACCAAAAATCCCGCGTTTTGCGTTTTGAAAAATTTCCCGCCGCGAGACGACCGCCTGACTACGC  
AGATGAAATCGGTGGGCGAAGTGATGGCGATGGGACGCACGATTTCAGGAAAGTTTTCCAAAAAGCCCTGCGCGGCT  
TGGAAACAGGCTTGTGCGGCTTCAATCCGAGAAGCTCCGACAAAGCGGAAATCCGCCGCG

**SEQ ID NO. 441 *Klebsiella oxytoca***

ATTGCCCCCTCGACTATTATGACCGACCCGGAATGGCCGATGCCACCTACATCGAGCCGATTCACTGGGAAGTG  
GTGCGCAAGATCATTGAGAAAGAGCGTCCGGATGCGGTTCTGCCGACCATGGGCGGCCAGACGGCGCTGAACTGC  
GCGCTGGAGCTGGAGCGTCAGGGCGTGCTGGCCGAGTTGGGCGTGACCATGATTGGGCGGACCGCCGACGCGATT  
GATAAAGCCGAAGACCGCCGCCGTTTCGACGTGGCGATGAAGAAAATCGGTCTCGATACCGCGCGTTCCGGTATC  
GCGCATACCATGGAAGAAGCGCTGGCGGTTGCCGCTGAAGTTGGCTTCCCGTGATCATCCGTCCGTCTTTACG  
ATGGGCGGCACCGGCGGCGGTATCGCCTACAACCGCGAAGAGTTTGAAGAGATCTGCGAACGCGGTCTGGATCTC  
TCGCCGACCAACGAGCTGCTGATTGATGAATCGCTGATCGGCTGGAAAGAGTACGAGATGGAAGTGGTGCGTGAT  
AAAACGACAACCTGCATCATCGTCTGCTCCATCGAAAACCTTCGACGCGATGGGCGTCCACACCGGCGACTCCATCA  
CCGTGGCGCCGCGCAGACCCTGACCGACAAAGAGTACCAAATCATGCGTAACGCCTCGATGGCGGTACTGCGTG  
AAATCGGCGTAGAGACCGGCGGTTCCAACGTTTCAGTTCTCGGTGAACCCGAAAGATGGTCGCCTGATCGTTATCG  
AAATGAACCCGCGCGTCTCCCGCTCCTCGGCGCTGGCCTCGAAAGCCACCGGCTTCCCGATCGCTAAAGTGGCGG  
CGAAGCTGGCGGTTGGTTACACCCTTGATGAGCTGATGAACGATATCACCGGCGGCGCACCCCGGCGTCGTTTG  
AGCCGTCCATCGACTACGTCGTGACCAAAATCCCACGCTTCAACTTTGAAAAATTCGTGGGCGCGAACGACCGTC  
TGACCACCCAGATGAAATCCGTGCGGGAAGTAAGGGCGAATTCCAGCACACTGGGCGCGGTTACTAGTGATCCG  
AGCTCGGTACCAAGCTTGATGCATAGCTTGAGTATTCTAACGCGTCACCTAAA

**SEQ ID NO. 442 *Legionella pneumophila***

TTCGCCCTTCGACTATTATGACTGATCCTGAGCTTGCTGATGCCACCTATATAGAGCCTGTTCAATGGAAAAGAAG  
TGGCTCGTATTATCGAAATAGAGAGGCCAGATGCTCTTTTACCGACGATGGGAGGACAAACAGCCTTAAACAGCG  
CCTTGACTTGGTAAGAGAAGGGGTATTAGCCAAGTACTCTGTTGAAATGATAGGAGCGACGCGTGAAGCCATAG

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ACAGGGCGGAAGATAGAGAAAAATTTGCCAGCTGATGATTAAAATCGGATTGGATATGCCAAGGTCGGCGATTG  
CTCATAGCCTGGAAGAAGCAATTCAAGTACAAGCCCGTTTAGGCTTTCTGCCATCATCAGGCCTTCATTTACCA  
TGGGTGGTAGTGGAGGCGGTATTGCCTATAATCGTGAAGAATTTGAAGAAATTTGCATTAGAGGATTGGAGTTGT  
CGCCAACTCACGAGCTTTTGATTGATGAATCGGTTCTGGGTGGAAAGAATATGAAATGGAAGTCGTCAGGGATA  
AAAATGATAATTGCATTATTGTTTGTACTATAGAGAATTTTGACCCATATGGGAGTGCATACTGGAGATTCCATTA  
CCGTTGCTCCGGCACAAACATTAAGTATAAGAAATACCAACGGATGCGGGATGCGGCGATTAAAGTTCTAAGGG  
CAGTTGGTGTGGATACGGGAGGTTCCAACGTTGCGTTTGTCTATTAATCCTGAAGACGGGCGCATGCTGGTTGTGG  
AAATGAACCCGCGTGTATCTCGAAGCTCGGCTTTGGCGTCAAAAGCAACCGGTTTTCTATTGCTAAGGTCGCAG  
CTAAATTGGCTGTGGGCTATACCTTGGATGAATTGAAAAACGAAATCACCGGAGGTAAAACACCTGCGTCCTTTG  
AGCCCAGCATTGATTACGTCGTTACCAAAGTTCCACGGTTTAATTTTGATAAATTTCCACAACTCCAGATACTC  
TTACCACACAGATGAAATCAGTCGGCGAAGTAAGGGCGAATTCAGCACACTGGCGGCCGTTACTAGTGGATCCG  
AGCTCGGTACCAAGCTTGATGCATAGNCTTGAGTATTNCTAACGCGTCACCTAAATAGCTGGCGAAA

**Figure 20 represents sequences amplified with molecular marker VII ((EG10839 & EG11396 or *sfrB* & *yigC*) in Gram-negative bacteria (SEQ ID NOs 443-451).**

**SEQ ID NO. 443     *Pseudomonas aeruginosa***

tccaccagcagcgccgcgcagatatggcagttgccgttgccgcagctctgcggacagtcgtagccaagccgccgg  
gcgccatcgaggatgcgttcccccggcagcagctcgaggcaggcgccggacggttgaggacgatacgcatcagt  
cgatcccagaggtcgaccagagggcgctcgatgcgcgtgtcaccgcttcgtccttgacgatggcgcgccccatt  
cgcggtggtctcgcccgccacttgtgggtggcatcaagccccatcttcgagccgaggccggaaccggcgagg  
cgaagtcgaggtagtcgatggcggtgttgatcatcacctgtgcgcgttggggtccatccgcgtggtgatgg  
cccagatcacatcggttccagtcgcgcgcgatcgatgtcatcggtgacgatgacgaacttggtgtacatgaact  
gccgcaggaacgaccagaccccgagcatcacgcgcttgccgtgccctgggtactgcttcttcatggtcaccaccg  
ccatccggttaggaacaaccttccggcggcaggtagaaatcgacgatttccgggaactgcttctgcaggatcggca  
cgaacacttcgttcagcgccacccccgaggatcgccggctcgccggcgacgcccgggtgtaggtgctgtggtaga  
tcggtttctgcggggggtgacgcgctcgacggtgaacaccgggaagcgatcgacctggttagtagccggtgt  
gatcgccataggggccttcgtcgcccatctcgccggggtggatcaccccttcgaggacgatctcggcgtggccg  
gcacctgcaagtcgctcccgcgacacttgaccagctcggtacgatgccgcgcaacaggccggcgaaagcgtatt  
cggaagggtgtccggcacccggcgtcacccgacccgaggatgggtcgccggatcggcgcccagcgccacggctaccg  
gatagggtggtcccggtgcttctggcaccactcgcggtagtccagtcgcgcgcgcgatggctgagccagcgca  
tgatcaccttgttgccggcgatcacctgctggcggtagatgccagggttctgcggttcttgttcggcccgcggg  
taacggtcaggccccaggtgatcagcgcccgacatcgcccgccagcaggtctggaccggcgacccggccgaggt  
cgacgtcctcgccctcctcgaccacttcttggcagggggcgctccttgagcaccttcggcgccatggacaggacct  
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gcttgccgatctcgcgagtgcgccgacgtcctcgcgcccatgccagcgccacgcgctccggcggtaccgaaca  
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ggtcgcacacctcggtcatctcgagcacgggggaaatcggcacctggatgcgcttcaacgcaccgcgctgctcca  
gctggggcgatgaaatcgcgagatccttgaacgtcattggcctaaccattcactgcaagacccacatcctacct  
gctcccggcccatccggcagcaggcaaacgcggcattcggtcactgctggctggcgatcctcgagtcgctcgaggc  
tctgtagcatcggtcgaacaaaggcccgagttcatgggccccctgggtcgaaagggtggttgttatccatgtaca

**SEQ ID NO. 444     *Pseudomonas syringae***

ccgagcagacatggcagttaccgttgcgacagctttgcgggcattcatggcccagccgctgtgcagcatccagaa  
tccgctcgccccggcaggggttcgagtaccgcacccgaggggtgcaagggttacgcgcatcagttattcccaactg  
agtccagatctcgccacccggcgcggtggtggcttcgtccttgacgatcgccctgccccattcgcggggtggtttc  
ccctggccatttgttagtggtccatccaggcccattttggatcccaatccagacacccggagaggcaaaatcgaggta  
atcgatggcggtgttgatcatgaccgtgtcgcgcttgggggtccatgcgggtggtgatggcccagatcacgtc  
attccagtcacgcgcattgatgtcgatcatcggtgacgatcacaaatttggtgtacataaaactggcgcgaggaa  
ccagacgcccagcatcacgcgcttggcatggccggggtactgtttcttgatagtaccacccgcatgcggtaaga  
gcaccttcggggcgaggtagaaatcgacgatttccggaaactgcttctgcagaatcggcacgaacacttcgtt

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cagcgccacacccaggatagccggctcgtccgggtggacgcccgggtgtaggtgctgtggtagatcggttgatgcg  
gtgggtgatgcgctcgacgggtgagcaccggaaagctgtcgacttcgttgtaataaccgggtgtgatcgccgtaggg  
gccttcggttgccatctcgcccgatgaatcacgccctcaagcacgatttcggcactggctggcacttgcaggtt  
gctgccacggcacttgatcagctcgggtgcgcgagccacgcagtagcccggaaggcgtattcgacaggtgtc  
gggcaccggcggtcacggcaccgagaatggtcgcccgggtccgcgcccagtgcgacggccaccggataaggctcgcc  
aggatgcttgacgcaccagtcgcggaagtcaagcgcgccaccgcgatggctgagccagcgcgatgatgatcttggt  
gcggccgatgacctgctggcgataaataaccgaggttctgcgcgtccttggttcgggcctttgggtcacggtcaggcc  
ccaggtgatcagcggcgcgacatcgcccgccagcaggtctgcaccggcaacatgccgagatcgacgtcatcacc  
ctcgatgacgatctcctggcaggggtgcatccttgacgaccttgggcgccatggcgatgactttgcggaagatggg  
cagcttgaccaggtcatctttcaggcctttgggcggctcgggctccttgagaaacgcaagcaacttgccgatttc  
gcgcagctcgggtgacggcttcgcgcccattgccatggccacgcgctccggcggtgccgaacaggttgccagcac  
cggaatatcaaagccaaccgggttttcaaacagcagggccgggctttggcgcgcaaggtagcgtcacagatttc  
agtcatttccagcacaggcgagatcgccatctgaatgcgtttcaactctccgcgtgctccaactgctgcacgaa  
atcccttagatctttgaatttcattaaaccggccatttatccaaatagacgcacatcgtaacctgctccgcctc  
caaggcagcaaattccagggcgacagggcaaaaaaatgggtgccccgaaggacaccattttttgagccagcctgtc  
tgttacttgcgtttcatggacaggaagaactcgtcgttgggtcttggtctgcttgagcttgatgaggaactcg

**SEQ ID NO. 445     *Bordetella parapertussis***

aratgggtgatggggcgggcgcccggtcgggctgctcaagctggccggcggtggcgctgggtgggctggcagg  
cataccggatctggcagtcgcgcgcgaggagcgccaggccgattgagccaggccggcgaggcgggcgccggcg  
cgcccgggcattgctacagtcaccagcgtgtccacatggcatccaccggcgcttgaccgcctcgtccatgtgt  
atgggcgtgccccattcgcggtgggtttcgccgggcaacttggtgggtggcgctccagccccatcttgccgcccagg  
ccggacaccggcgaggcgaaatcgaggtaatcgatcggcgtgttctcgaccagcacggtgtcgcgcacgggggtcc  
atgcgcgtggatggcccagaccacttcgggtccagtcgcgcgggtcgatgtcttcgtcgaccaccacgatgaac  
ttgggtgtacatgaactgccgcagcacgctccacaggccgaacatcacgcgttgggcggtggccggcggtactgcttg  
cggatcgacaccaccgccaggcggtagctgcagccttcgggggcaggtagaaatcgacgatttcgggcagctgg  
cggcgagcagcggcacgaatacctcgttcagcgccacgcccagcacggccggctcgtcgggcggcttgccggt  
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ttgtagtagccggtatgggtcgccataggggccttcgagggccatttcgtagccggtggccggggggcggttgccg  
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gaggccggcaccgacaggtcgtgcccagcgcccttgacgacctcgggtgcgcgagccgcgcagcagcccggaac  
tggtatttcggacagcgtgtccggcaccggcggtgaccgcgtccaggatgggtggccgggtcgccaccagcgccacg  
gcgatgggaaacgacttgcccgggtgggcctgggcgtgggtcgcggaagtccagcgcgccgcggcggtgcgacagc  
cagcgcatgatcagcttggttcggccccagcggtgctggcggttagataaccaggttctgcgcggggcggttcggc  
ccgcgcgtgatcaccaggccccaggcgagcagggcgccacatcgccggccagcaggtctggatgggcaggcg  
cccaggtcgacgtcggcgcccttcagacgatttctggcaggcggtgcgcacgggtcttggggctcatgtcc  
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gaggccagcagttcgccggtttcgcgaggggcgccgacgtcgtcggcccccatgcccaggcgaccgcgcggc  
gtgccgaacaggttgccagcaccggcatgtcggccggcgcgctcgttggtggcgggcggttctcgaacagcagggcc  
ggccgcggcgcgagcaccgggtcggaatctcggtcatttccagccgctcgagaccggcgcggtgatgcgt

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ttgagttcgccctggcggttcaagctgggcaagaaaatctcgagggtcgcgatacttcaaggcagatcccggcaaa  
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tgcgtcagtgggcggcctgttccgacagctggcccaaggagtgaccaccatctcgccgaat

**SEQ ID NO. 446     *Neisseria meningitidis***

acagaaaatcctcgaagacaccctgctggaacaatggcagtggtcaaaccctaaagaaccgtaaacaatcctgcgt  
acacaaatgccgtctgaaacgccccacgcttcagacggcagaccgtaaaacctaacaacccaattcctcccaaa  
tctcatcaatcttagccgtaaacgcagggtcttttttaatacaccggtccccattcgcggtcggtttcgccggcc  
acttgttggtcgcataccaaaccattttgcccgaagtccgctgacgggggtggcgaagtgcaggtagtcgatgg  
gcgtgttttccatcaaaacggtatcgcgacgggggtccatgcgcgtggttaccgcccagatgacttctttccagt  
cgcgacatccacatcgatcatccaccacaatgatgaatttggtgtacataaactggcgaggaacgaccagcagc  
ccatcatcacgcgcttggcgtgtccggcgtaactgtttttcatgctcaccaccgccatgcggtaggagcagcctt  
cgggcccagagtaaaaatcggtgatttcggggaaactgcttttgcaaaagcggtagcaaacacttcgttcaacgcc  
cgcccaaacggcggttcatcgggcggtttgcctgtgtaggtagagtggtaaatcgggtttgcgcgatggtga  
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acgcggtttcgtttggatggatgacgccttccaacacgatttctgcgcgggcaggcacttgcaaatcgttgccga  
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ccagcggcgcaacgtcttccggccagcaatgctgaatcggaagttgatacaaatcaacgtcttcgccttcccata  
cgatttcttgacacggcgcatttttaccacgttcggcgccatgctccaaatgtctttcaagagcggcagtttg  
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accgcccctatccttgctgcgttcggcatattctatgccgtgataaaagtgcgcgtaccagcggatgttcgctg  
ccttgatggagttgcaacaaggacgttgaccatcggggttggttaacgacattgcaatgcaaacggaagggtgcg  
gattcgtaagggggcagccggttgagatcatgccgaataaacggcggttttcagggttg

**SEQ ID NO. 447     *Shigella flexneri***

ctgaccagcacgaaaagaaaaggccgctctggcacgatgcggacacgatatacgggtatccgtgatagctgctac  
cgagggtcactttacagcttaagggtgtcatgcgctttctctgtcggatcgataaatagggcaaaacaaacgcgca  
tcaggcgcttttaccgttgtaaaaaatagccagttcatcccagatggcgtaaatatgcgcgacaacatctggatc  
ttttttgatgggacgtccccattcacgctgggtttccccggccattttattcgtggcatccagccccatttttga  
accagcccagagacaggcgaggcaaaatccagataatcaataggcgtattttctaccagaacagtatcccgcgc  
cgggtccatacgggtggttaatcgcccaatcacatcgttccagtcgcgtgcgttgacgtcatcatcgaaacgat  
caciaatttagtgtaataaactggcgtaagaacgaccagacgcccattcatgacgcgcttcgcgtgtccggcgta  
ctgttttttgatcgctcactaccgccagacgataagaacagccttccggcggcaggtaaaaatcgacaatttccgg

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gaactgtttttgcagaatcgggtacaaacacttcgttcaacgccacgcccagtagccggtgctcatctggcggaacg  
cccgggtatagggtggaatggtaaatcgcatcttcacgctgggtaatatgcgtcacggtaaacaccgggaaattatc  
gacttcattatagtaacctgtgtggtcaccatacggcccttccggcgccatctcaccaggatcgatatacccttc  
caggacgattttcggcactggctggcacttcgaggtcattggaaatacactttactacttcgggttttggcgccgcg  
tagcaatccggcaaaacgcatactctgaaaagcgtatccggaacgggggtgactgcaccgagaatcgtggcaggatc  
ggcaccacagcgccacagaaaccgggaaacgttcgcccggatgcgcccacaccactcctgataatccagcgcgcc  
gccgcatgacgacagccagcgcataatcagtttggtttttaccaatcagctgctggcgataaatgccagattctg  
ccgctctttatgcgggccgcggttacggtcagccccaggtaatcagcggcgccgcatcttccggccagcaggt  
cataatgggaatgcgattgagatcgacgtcatcgccagagacgattttttgttggcaggcgccaccacgcagtcg  
ctttgtcggcatgtttaacacctgcttaaaactgcggcagtttatcaaacaggctcgcggaaccttttggcggtc  
cggtcttttcagaaacgccaaataattttaccaacttcacgcagcgccgaaacatcttcctgccccatgccatcgc  
cacgcgctttggcgtaccgaacaggttgacagcaccggcattgagtagccttttagggttttcgaacaacagcgc  
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tttttagctcaccctgctgttcaagcagcgtcaggaagtcgctgtaaatcggttatatttcattggcgtccattgtagc  
ctcttaatctgcgccattatacggcgttcattctttgcaatgctgtaaattttgttaaattagcgtgaactctgac  
gggtataacgcaaacggggaatataattaacttagcgtaaagcttttgctatccttgcgccccgattaaacggat

**SEQ ID NO. 448     *Escherichia coli* K12**

catgactgctttcgcgtaaaggttgatttcagaagcgccaatatgcagctcgataaacctttttcatccggcgt  
cgaagccattgagaacggacgtttgtcgcgctcatccatcactaccatcaaatactgaccagcacgaaaagaaaa  
ggccgcgtctggcacgatgcggacacgatatacgggtatccgtgatagcttctaccgaggtcactttacagcttaa  
ggttgtcatgcgcttttctctgtcggatcgataaatagggcaaaaacaaacgcgcacagggcgtttttaccgttgtt  
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ttcacgctgggtttcccccgccattttattcgtggcatccagccccatttttgaaccagcccggagacaggcga  
ggcaaaaatccagataatcaataggcgtattttctaccagaacagtatcccgcgccgggtccatacgggtggtaat  
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cgccaggcgataagagcagccttccggcggcaggtaaaaatcgacaatttccgggaactgtttttgcagaatcgg  
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gggcacttcaagatcattggagatacacttcaccacttcggtcttggtgccacgtagcaatccggcaaaacgcata  
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ttgcttaaaactgcggcagtttatcaaacaggctcgcggaaccttttggcggtccggctcttttcagaaacgccaa  
taattttaccaacttcacgcagcgccgaaacatcttctgccccatgccatcgccacgcgcttttggcgtaccgaa  
caggttgacagcaccggcattgagtagccttttagggttttcgaacaacagcgcaggccccaccggcacgcaaagt

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gcgggtcagcaatttcagtgatttccagatgcggatccacogggagcgtgatacggttttagctcaccctgctgttc  
aagcagcgtcaagaagtcgcgtaaatcggttatatttcattggtccattgtagcctcttaattctgcgcc  
cattat

**SEQ ID NO. 449 *Escherichia coli* O157:H7**

agaagcgccaatatgcagctcgataaaaccctttttcatccggcgtcgaggccattgagaacggacgtttgtcgcg  
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tacggtatccgtgatagcttctaccgaggtcactttacagcttaagggtgtcatgcgctttctctgtcggtatcga  
taaataggggcaaaacaaacgcgcacatcaggcgctttaccggttggttaaaaatagccagttcatcccagatggcgtc  
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cgtggcatccagccccatttttgaaccagccccggagacaggcgaggcaaaatccagataatcaataggcgattt  
ttctaccagaacagtatcccgcgctgggtccatacgggtggtaatcgcccaatcacatcgttccagtgcggtgc  
gttaacgtcatcatcgcaaacgatcacaaatttagtgtaataaactggcgtaagaacgaccagacgcccacatcat  
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caggtaaaaatcgacaatttccgggaactgcttttgcagaatgggaacaaatacttcgttcaacgccactcccag  
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cactacttcggttttgggtgccacgtagcaatccggcaaggcgatttccgacaaagtatctggtactggtgtgac  
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atatttcatggcgctccattgtagcctcttaattctgcgccattatacggcggttcattctttgcgatgctgtaaatt

**SEQ ID NO. 450 *Bordetella bronchiseptica***

tcccacatggcatccaccggcgcttgaccgcctcgatcatgtgtatggggtgccccattcgcggtggtttcg  
ccgggccacttggttggtggcgctccagccccatcttgccgcccaggccggacaccggcgaggcgaaatcgaggtaa  
tcgatcggcggtgttctcgaccagcacggtgtcgcgacgggggtccatgcgcgtggtcatggccagaccacttcg  
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cacaggccgaacatcacgcgttggtggtggcggtactgcttgcggatcgacaccaccgccaggcggtagctg  
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ccttcgagggccatttctgtagccggtggccggggggcggttgggcgccctcgggcaccgcggcagcgacggcgcg



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ggatcgtcgccggcagcaggtggccctcgagcacgatctcgcccgaggccggcaccgacaggtcgctgccagc  
gccttgacgacctcggtgcgcgagccgcgagcagcccggaactggatttcggacagcgtgtccggcaccggc  
gtgaccgcgcccaggatggtggccgggtcgggcaccagcgccacggcgatgggaaacggcttgcccgggtgggc  
tgggctggtcgcggaagtccagcgcgcccgcggtgcgacagccagcgcatgatcagcttggtcgccccagc  
ggctgctggcggtagatacccaggttctgccgcccggcggttcggcccgcgctgatcaccaggccccaggcgagc  
aggggcgccacatcgcccggccagcaggtctggatgggcaggcgggccaggtcgacgtcgcgcccttcccagacg  
atttcttgccagggcgcgctgcgcaaggctcttggggctcatgtcccacaggcggtttcagcatggacacctg  
gccagcgctcgcgaggcccttgggcgcttcgggctcgcgaggaggccagcagttcgccggtttcgcgagg  
gcgcccagctcgctcgcccccatgccccaggcgaccccgcgcggtgcccgaacagggttgccagcaccggcatg  
tcggccggcgcgctcggtgtggcgggcggttctcgaacagcaggggccgggcccggcgcgagcaccgggtcgga  
atctcggtcatttccagccgctcgagaccggcgcggtgatgcgtttgagttcgccctggcggtcaagctgggca

**SEQ ID NO. 451     *Bordetella pertussis***

tgtatgggctgccccattcgcggtgggttcgcccggccacttggtgggtggcgctccagccccatcttgccgccc  
aggccggacaccggcgaggcgaaatccaggtaatcgataggcggttctcgaccagcaccgtgtcgcgacgggg  
tccatgcgctggtcatggcccagaccacttcgggtccagtcgcggggtcgatgtcttcgtcgaccaccacgatg  
aacttggtgtacatgaactgccgcagcacgctccacaggccgaacatcacgcgcttggcgtggccggcgactgc  
ttgcggtatcgacaccaccgccaggcggtagctgcagccttcggggggcaggtagaaatcgacgatctcgggcagc  
tggcgggcgagcagcgggcacgaatacctcggttcagcgccacgcccagcagcgccggctcgctcgggcggttgccg  
gtatagggtggagtggttagatgggggttgcgccgatgggtgatgcggtccaccgtgaacaccgggaaccagtcctgc  
tcgttgtagtagccggtatggtcgccataggggccttcgagcgccatttcgtagccggtggccggggcggggttg  
gcgcccctcgggcaccacggcgagcgagcgcgcggtcgctcgggccggcagcaggtggccctcgagcacgatctcg  
gccgaggccggcaccgacaggtcgctgccagcgcccttgacgacctcggtgcgcgagccgcgagcagccggcg  
aactggatttcggacagcgtgtccggcaccggcggtgaccgcgccaggatgggtggccgggtcggcgcccagcgcc  
acgggtgatgggaaacggcttgcccgggtgggcctgggcgtgggtcgcggaagtccagcgcgccgccccgggtgcgac  
agccagcgcatgatcagcttggtcgccccagcggtgctggcggttagatgccaggttctgccgcccggcggttc  
ggcccgcgctgatcaccaggccccaggcgagcagggggcgccacgtcgccggccagcaggtctggatgggcagg  
cggtcagctcgacgtcggcgccttcccagacgatttctggcaggcgcgctgcgcacggtcttggggctcatg  
tcccacaggggcggtttcagcatggacaccttgccagcgcgctcgcgaggcccttgggcgcttcgggctcgcg  
agggaggccagcagttcgccgggttcgcgagggcgccgacgtcgtcggcccccatgccccaggcgacccggccgc  
ggcgtgcccgaacagggttgccagcaccggcatgtcgccggcgcgctcggtgtggcgggcggttctcgaacagcagg  
gccgggcccggcgcgagcaccgggtcggaatctcggtcatttccagccgctcgagaccggcgcggtgatg  
cgtttgagttcgccc

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**Figure 21 represents sequences amplified with molecular marker VIII (hypothetic yleA protein) in Gram-negative bacteria (SEQ ID NOs 452-461).**

**SEQ ID NO. 452     *Haemophilus influenzae***

Tatctgctgctggcgtagctggtcggtgtagtacacaaaactgaagctcatatcaaagtttacttgtgcaatca  
aattcatagtttgctcaaaaatcttcgcggtttcaccagggaaccaacaataaagtcagagctgatttgaatat  
ctgggcgcacagcacgaagtttacgaataatggatttatattctaagtcggtatgagcacgtttcatcattgtta  
atacacggtcagaacctgcttgactggaagatgtaagaaactcactaattcaggcggtatcacgatacacatcaa  
taatatcatcggtaaattctattggatgactggttgtgaaacgtaaacggtcaataccatcaattgatgcgacaa  
gacgaagcaactcagcaagctgcaaatgtgaccatcatgcgttgccccacgataagcattttacattttgaccaa  
gtagattgacctcacgcacacctgttcgcgaagttgcgcaattttcaaatagcacatcatctacaggacggctaa  
cttcttctccacgagtataaggcacaacacaaaaagtagtattttattacagccttccataatggaacaaatg  
ccgttgggccttctgcgcgaggttctggttaagcgggtcaaattttctcaatttcagggaacttacgtctacgacgg  
aactttttccaccacgaatttgattaatcatttcaggcaagcgatgcaaagtttgcggtgccccaaaaataatcca  
cataaggcgcacgatggcgaatatgttcccccttcttgagaggctacacagccgccccacaccaatcactaaatttg  
gattatttttctttaattctttccaacgccccagttggtggaacactttttcttgtgctttttcacgaatagaac  
aggtatttaataataataacgtctgcttcttcagggtgcttccgtgagttctaataccgtgggtgcttaataaaagat  
cagccatttttagatgaatcatattcattcatctggcagccccaagttttaatatgtaatttttgagtcattttct

**SEQ ID NO. 453     *Pasteurella multocida***

ctacgcgtgataacgtcccacgcgagttcatcttctttacgagtacgattaatcaccattttgtggcgattgaac  
aacgcgaagtcccatttgttcttcagttctaacgacttcaccacgcagtgagtttagtaaacacatccgtgatctt  
gatatcaacaaacttcccaatcatatcaggcgtgccccacaaaattgacgatacagattagtttctgtacgcctgt  
gagttccattaaatcttttttcgagggtccttccactaacacgcgctgttctgtgcctaacattgctcgactaaa  
ttgcgcggcttgattgttaatgcgttggtgcaacacatataaacggtgtttcttctcttcttctgtcacatcatc  
aggcatatctgctgctggcgtgacctggacgtgctgaataaatgaagctgaaactcatatcaaaatttacttgtgc  
aattaaattcatggtttgctcgaaatcttctgctgtttcgcccggtgaaacgcgacaataaaatctgagctaatttg  
aatctctggacgcacgcgtctttaacttccgaataatcgatttatattctaataccgtatgattgcgtttcatcat  
agataacacacgatcagaaccactttgtacaggtaagtgtgaagaaactcaccaactctggcggtatcacggtacac  
atcaataatgtcatcagtgaaactcaattgggtgactggtggtgtaaacgtaaacggtcaataccatcaatagcggc  
tactaaacgtaacaattccgcaaaagtacaaataacgtcatcatgagttgcaccacgataagcgttcacgttttg  
tcctaataaattcacttcacgcacgccttgcctctgccaaactgtgcaattttcaaataatacatcatccactggacg  
actgacttcttcaccacgcgtataaggcagcacagaatgagcaatattttattacagccttccataatggatac  
gaaagcagttggaccttctgcacgcggttctggttaaacggtcgaatttttcaatttctggaaaactgacatcgac  
tactgagcttttaccacctctgatctgattgatcatttcaggtaaacgatgtaagggttgggtggtgccccaaaaataat  
atcgacataaggagcagcagtagaatgtgttctcttcttctgtgaggcaacacagcccccaacaccgataacgag  
tcccggttatgtttctttaattctttccaacgtcctaattgatggaaaactttttcttgtgctttttcacgaat  
tgagcaagtgtttaacaataacacatccgcttcttccggaattttctgttaactctaagccgtgagtagtctgttaa  
gagatctgccatttttagatgaatcatattcattcatctgacaacccccacgtttttaatatgtaatttttgcgcat

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**SEQ ID NO. 454     *Haemophilus ducreyi***

ggacgcgcagagtagataaagctaaagctcatatcaaaaattgacttggtcaataattttcattgtttgttcaaag  
tcttccgctgtttcgccaggaaagccaacaatgaaatctgagctaatttgatatttgagcgaaccgcacgtaat  
ttacgaataatggctttgtattctaatacggtgtggttacgtttcatcatgggttaaacacgatcggcgccactt  
tgataggtaaatgcaagaagctgaccaattctggagtatcacgatacacttcaataatgtcgtcgggtgaattca  
atgggggtggcttgtggtataacgtaagcgggtcaataccatcaatggcggcaactaaacgtaataattctgcaaaa  
gtgcaaatgccaccatcaaagggtttcaccacggtaagcattaacgttttgaccagcaagttaacttcacgaacg  
ccttgctctgctaattgtgcatgttcgaataagacatcatcaacagggcgggaaacttcttcaccacgggtataa  
ggcactacacagaatgagcagtatattattacagccttcataaattgatacgaaagcagttggaccttctgctttg  
ggttctggtaagcgggtcgaatttttcaatctctgggaaggagatatcgactactgcacgatcgctgatcggatc  
tggttgatcatttctggtaagcgggtgcaatgtttgtggcccaaatactatatcaacaaaaggggcacgttcacgg  
atatgttcaccttcttgtgaagcaacacagccaccaacgccaataattaaatcgggtttgtcctttttccagttt  
ttccaacgaccaagttgtgaaaagactttttcttgtgctttttcacgaattgagcaagtattcaataataaaata  
tccgcttcttcagggttatcgggttaattctaatacgtgtgttgagtttaagagatctgccatttttgatgagtca  
tactcattcatttggcaaccccaagttgtgatatgtaattttgccataattttcaaaaaataataaatatctcaa  
taagttaaaataaaagcgtaaaagagacagttccctttacgcacatctttaatcgtgctattctacctgtttgcttat  
tttttcgctagagttaatcgcttaataagcaaaatgccacgatattgctagcgtgacatttttatcatgagaggat  
gttattgtttgggttaagggtcaatacaacactttcacccggcaacaacatttccaacttttt

**SEQ ID NO. 455     *Vibrio parahaemolyticus***

Aggacgcgctttacgtagtttacggatgatcgacttgactcgatagctgtgtgaggacgcttcatcatcgttag  
aatacggtcactaccactttgtactggcagggtgtaggaaactcacaagctccgggggtatcttcgtaaaccgcgat  
gatgtcgtctgtaaaactctagcgggtggctagtcgtgaaacgaatacggtcgataccatcgatagatgcaacgag  
acgaagcagttcagcaaaaagagcagatctcgccgctcgtgcatagggccacgggtatgcgtttacgttttgacctag  
taggttaacttcacgtacaccttgttccgctagctgtgcaatctcgaataaacgcatccattggacgactaac  
ttcttcaccacgagtgatggtacaacgcagtaagtgcagtatgttgaaacagccttccatgatagaaacaaacgc  
cgtcgcaccttctgcacgtggctcaggtagggcgggtcgaacttttcaatctctgggaacgaaatgtccattaccgg  
tgcacgtcagtttgagattgtttgatcatctcaggtagggcgggtgcagagtttgaggggccaaagatcacgtcaac  
gtatggtgcacgctcacggatgtggtcaccttcttgtgttgctacacaaccacctacaccgataactacgccagg  
ttttttatcttttagtggtttccaacggcctagctgggtggaaaactttctcttgccgtttttcacggatcgaaca  
gggtgttaagtagaagtagctctgcttccctctggctcttccgtcagctcatagccgtttgcagcattaagcaggtc  
ggccatttttgatgaatcgatctcgttcatctggcagccccagggttttaattagcagtttcttactcatctcact  
ttcgctcgttcagttgtacttaaaattggagagctattgctcaaattatagccgccatcacggcggtaagcggcgt  
attgtactgctttaaaagcacctgactagtgatctgacgaattctctgcaaacctgatgaaatctagtttttt  
gccctatatacagcaagggtttttgtttaa

**SEQ ID NO. 456     *Yersinia pestis***

gaatttaccaatcatgtcgggtgaaccctcaaagttcacgacgcgggtgttttccgtacgcccggccagttccat  
gacatttttgcgagaggtaccctccacaaaacacgctgtactgtccctaccatcttacggctaatttccatcgc

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ctgttggttaaatgcgttggtgcaggatatgtagccgctgttttttctcctcttcggacacattggttggttaaatac  
agccgctggtgtgccgggacgcggggagtaaataaagctgtagctgggtatcaaaatgaatatctgcgaccagttt  
catggtctgttcaaaatcctgctgggtttcaccaggaagccgacaataaaatcagaacttatctggatatcagg  
gcgtgcttgacgcagtttgcggtgatggctttgtattccaaggcggtatgggcacgcttcatcatggtcaaaat  
acggtcagaaccgctttgtaccggcaaatgcaggaagctcaccaattcaggcggtatcgcgataaacatcaatgat  
atcgctcagtaaactcaatggggtggctggtggttaaactcgtaacctatcgataccatcaatcgccgcaaccaaacg  
caacagctcggcaaaactacagatatcgccatcgtaggttgccccgcggtaggcggttaacattctggccgagtaa  
gttgacttcacgtacgccttgagcggctaactgggcgatttcaaaaagaatgtcatcgcttgacggctgacttc  
ctcgcctcgggtgtagggtagcacacagaatgtacaatatattattgcagccttccatgatcgaacaaaacgcagt  
tgggccttcagcccggtgttctggcaaacggtcaaatttttcaatttcgggaaaactgatatccacgacagggt  
attcgttccttgacgtgggttaatcatttccggtaaacgatgcagcggttggtggcccgaagatgacatcgacaca  
gggggcgcgctggcgcaattgttcaccttctctgtgacgccacgcaaccacccgaccccaataatcaactgcgggtt  
tttctctttcaataatttccattgcccagcaggtgaatacttttctctgtgcttttcccggtatagaacagggt  
atthagcagcagtaaataccgcttcttccgggatgggtggttaactggtagccatgggtactggccaagagatctgc  
catttttagatgaatcgatttcatctggaaccccgaggttttgatatgcagtttttttagtcatcggttatt  
catcatcaaaatcacctcgttccgtgcggtactcgttggttagataatctccgttgtagtagagagtcgcaaa  
ggcttcgtcgttagggagcattgtagtcatttgcctctgcgatgaccaccgcagaaccggttgagttattctgttg  
agtataaaaaatccgttacactgcggttagacaaaaccttgctaattg

**SEQ ID NO. 457     *Salmonella typhimurium***

gccgagcatacggcggtccatgccatcgctgctgattgatacgcctcttgagaatatacagacgctgcttctt  
ctcttcttccggcacgtcatcaaccatatcggcagccggcggttcccgacgcgcagagaagataaagctgtagct  
catatcaaagttgacgtcagcgataagcttcatggttttttcgaaatcatcggtagtttcgccagggaatccgac  
gataaagtcagagcttatctgaatgtccggccgcgcgcgcgcagtttacgggatgattgctttatatccagcgc  
agtgtgggtgcccccatcagattcaacacgcgatcggaaccgctctgtaccggcagatgcaggaaactgaccag  
ttccggcggtatcgcggtatacctcgataaatatcgctcggtgaactcaatcggtggctggtggttaaagcgaatac  
gtcaatgccgtcgatggcggaaccagacgcagcagatcggaagggtaccgggtgggtgccgtcgtagttttctcc  
gcgccaggcggttaacgttctggcccagcaggttgacctcacgcacgccttgccgcgctaactgggcgatttcgaa  
caggatatcgctctgagggacgggtgacttcttcaccgcgggtatacgggtaccacacagtaagtacaatatatttatt  
gcagccttccatgatagaaaacgaaagcggtcgggccttctgcgcgcggttccggcaaacggtcgaaacttctcgat  
ttccgggaagctgatatcgaccacggggtcggtcgccacgcacggagttaatcatctccggtaggcggtgtaa  
ggtttgccggccaaaaataatgtcgacgtaatgggcgcggttgacgaatgtgctcgccttctgggaagccacgca  
gccgcgcagccgataatcagatcgggatttttctcttttaacagttctccagcgacctaattgatggaagacttt  
ttcttgagccttctcgcggttgagcaggtattcaacagcagcacatccgccttctccgccacgtcggtcagttg  
atagccgtgggtggcggtccagcagatcgccatcttcgatgaatcgtaactcgttcatctgacagccccaggtttt  
aatatggagtttttttagtcatcgacttgctcttgcgaaatagtggtgaaaagcagggcgcatagtgtaatgctt  
tggcgcggttgtagccagtatgactgacgtcagccctaattgggtaaaaaatcctgtaaacttgctaaaaacgtaa  
caggatgaatgaccatgacaaatcaaccaacggaaattgccattgtcggcgggggaatgggtcggcggcgcgctgg  
cgctgggtctggcgagcaagggtttacgggtgatggtaatagaacatgccgcgcctgcgcggtttgtggcgga  
gccagcctgacgtgc

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**SEQ ID NO. 458     *Vibrio cholerae***

tcttcacttcttccgacagatcgcaaggatagtcagcgcggtgtgcctggacgaggtgagaaaaataaagctaa  
agctcatgtcgaaatcgacatcgcgatcagcttcatggtgtcttggaatctttgtcggtttccctgggaagc  
caacgataaaatcagagctgatttgaatatctggcggtgctttacgtagcttacggatgatggatttgtactcaa  
tcgccgtatgtggacgcttcatcatagtcagaatgcgacgctcccactttgtactggcaagtgcaggaagctca  
ccagctcaggcgtgtcttcgtacactgcaataatgtcatcggtaaattcgagtggtggctagtggtaaagcgga  
tacgatcgatgccgtcaatggtggcgaccaaacgcagtaattcagcgaaagagcaaagccgcatcgtagtggtg  
caccacggtaagcgttgacgttttgacccagcaggttaacttcacgcaccccttgctcggaagctgagcgatct  
cgaacaggacatcgctccataggacggctgacttcttcaccgctgtgtaaggcactacgcagtaagtacagtatt  
ttgagcagccttccatgatagaaacgaacgcggttgggccttccgcacgtggctcaggcaggcggtcgaattttt  
caatctcagggaagagatatccatcacgggcgcgtcgctgggtttgcgattgtttaatcatttctggcagacgat  
gcagcgtctgtgggccaagatgacatccacataaggcgacgatcggaatcgagtcaccttcttgagtagcaa  
cacagccaccgacaccgatcacgacacctggcttcttgtctttcagggttttccaacgaccgagttggtggaaga  
ctttttcctgcgccttttcacgaatcgaaacaggtgtttaggagtaaaacgtcagcttctcgggtatttctgtca  
gctcatagccgtttgcagcattaagcaggtcagccattttcgatgaatcgtagtctgttcctgtggcagcccaag  
ttttaattagcagtttcttactcatctcactttcgctcggttcaatagttcttcaatcatttgagctgtagctcac  
attctagccgcctctcggcggttaagcggcggtattgtactgctttaaaaaccgactgactagtaattggcggaat  
tctcttgtaacccttg

**SEQ ID NO. 459     *Escherichia coli* K12**

tatacagacgctgcttcttcttcttccggaacatcatcaaccatatcggcggctggtgtacccggacgtgcag  
agaagataaagctgtagctcatgtcgaaattgacgtcggcaatcagcttcatcggtttctcgaagtcttcgggtgg  
tttcgccagggaagccaacgatgaaatcagaactgatctgaatatctggacgcgcgcacgcagtttacggatga  
tcgctttgtactccagcgcggtatgggtacggcccatcaggttcagaatgcgatcggaaccgctctgtaccggca  
gatgcaggaagctcaccagctccggcggtgcgcgatacacttcgatgatacgtcgggtgaattcgatcggtggct  
ggtggtaaagcgaatacgatcgatcccgctcgatcgagcaaccagacgcagcagatcggcaaacgatccggtggt  
gccgtcgtagttttcaccacgccaggcggttcacgttctgaccgagcaggttgacttcacgcacgccctgagccgc  
aagctgggcaatctcaaacagaatatcgctcggaacggacggcttacctcttcaccacgggtgtaaggcaccacgca  
gtaggtgcaatatttattgcagccttccatgatggagacaaacgcggctcgcccttcggcgcgcggttccggtag  
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ctccggcagacgggtgcagcgtttgcgggccaaaaataatatcgacatagtgggcgcgctggcgaaatgtgctcgcc  
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caactgatggaagactttttcctgagccttctcgggattgagcaggtgttcagcagcagcacatccgcttcttc  
cgccacgtcggtcagttgatagccgtgggtggcatccagcagatcggccatcttcgatgaatcgtagtctgttcac  
ctgacagccccagggttttaatatggagttt

**SEQ ID NO. 460     *Escherichia coli* O157:H7**

Catcatcaaccatatcggcggctggtgtacccggacgtgcagagaagataaagctgtagctcatgtcgaaattga  
cgtcggcaatcagcttcatcggtttctcgaagtcttcgggtggtttcgccagggaagccgacgatgaagtcagaac

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tgatctgaatatctggacgcgccgcacgcagtttacggatgatcgctttgtactccagcgccgtatgggtacgtc  
ccatcaggttcagaatgcgatcggaaccgctctgtaccggcagatgcaggaagctcaccagctccggcggtgtcgc  
gatacacttcgatgatatcgctcggatgaattcgatcggatggctgggtggttaaagcgaatacgatcgatcccgctga  
tcgcagcaaccagacgcaacagatcggcaaacgatccgggtgggtgccgtcgtagttttaccacgccaggcggttca  
cgttctgaccgagcaggttgacttcacgcacgccctgagccgcaagctgggcaatctcaaacagaatatcgctcag  
acggacgggttacctcttcaccacgggtgtaaggcaccacgcagtaggtgcaatatttattgcagccttccatga  
tggagacaaacgcggtcggcccttcggcgcgcggttcgggtagacgggtcaaacttctcgatttccgggaagctga  
tatctacaaccgggctgcggtcgccgcgcacggagttgatcatctccggcagacgggtgcagcgtttgcggcccaa  
aaataatatcgacatagtgggcgcgctggcgaatgtgctcgccttcttgcatgccacgcagccaccgacgccga  
taatcaggtctggattcttctcttttaacagtttccagcgacccaactgatggaagactttttcctgagccttct  
cgcggttgagcaggtgttcagcagcagcacatccgcttcttccgccacgtcggtcagttgatagccgtgggtgg  
catccagcagatcgcccatcttcgatgaatcgactcgttcacatcgacagccccagggttttaatatggagtttt  
tggtcatcgacttgctcttgcgaaatagtagccaggaatgcagggcgcatagtgtaatgctttgctgccgttggtg  
accagtatgagcgtt

**SEQ ID NO. 461**     *Pseudomonas aeruginosa*

ccgccgtacggtcgctcggcctcaatgcaggggtgctgtcgatcagggtagccgcgcagcgagtgccgcagcgcgctcg  
tcgatgtgcacctgggcgaactggccgatcaggcgtggattgtcgcagcggaaagttgacgatccggttgttctcg  
gtgcgccccctggagcatgcctgggtccttcttcgagaagtcgggtgaccaggatccgctgggtgctgccaccatg  
cgccggctgatctcgtagccttgctgggtggatgcggctctggaggatctgcaggcgctgtttcttcacttcttcc  
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ccgacgtcctccaccagcttcattggtctgctcgaagtcttctcggtttcgccggggaaaccgacgatgaagtcg  
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